

The

Communicator

A Publication Of Surrey Amateur Radio Communications

Field Day 2018 Result:
#1 in Canada 3A

**December
2018**

SARC



December 2018



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The **Communicator** is a publication of the Surrey Amateur Radio Communications Society. It appears monthly, except July and August, for area Amateur Radio operators and beyond, to enhance the exchange of information and to promote ham radio activity.

To subscribe, unsubscribe or change your address for e-mail delivery of this newsletter, notify [communicator @ ve7sar.net](mailto:communicator@ve7sar.net)

Regular readers who are not SARC members are invited to contribute a \$5 annual donation towards our Field Day fund via PayPal.

SARC maintains a website at www.ve7sar.net and a Digital Communicator at ve7sar.blogspot.ca that includes recent news, past issues of The Communicator, our history, photos, videos and other information.

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On The December Cover...

The Directors of the Surrey Amateur Radio Communications Society wish all of you a very happy holiday season and hope that you will find that special Amateur Radio 'something' under your tree.

Our best wishes also for a healthy and prosperous New Year!





QRM

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...from the Editor's Shack

*Do you have a photo or bit of SARC news to share?
An interesting link?*

*Something to sell or something you are looking for?
eMail it to [communicator @ ve7sar.net](mailto:communicator@ve7sar.net) for inclusion in this publication.*

It has turned out to be a bit of a busy month for me as we unexpectedly made a move. We have been spending the past dozen winters in Southern California however, we have decided on a change in winter lifestyle and are now back north suffering the wet and cooler weather with everyone else.

While that may not sound like a smart decision to some, I personally think it will be a positive change. For the past number of years I have been missing out on a lot of the major contests because, living in an antenna restricted community, my amateur radio opportunities down south are not nearly as robust as what I have in Surrey. I'm looking forward to participating in more contests and other ham events in the coming months.

I will miss my attendance at Amateur Radio meetings down south because the community there is quite active and their meeting programs and exercises are informative and educational, even for someone with experience. The other thing I noticed down there is the presence of a lot more active female hams (YLs and XYLs). They are very visible both at meetings, events and on the air.

My attendance at the annual Quartzfest and at the hamfest in Yuma, AZ will also have to be more sporadic. Both of these

are highly recommended if you find yourself in the Southern California/ Arizona area around the beginning of the year, but equally rewarding is the June SEA-PAC Hamvention in Seaside, Oregon. It's a bit closer to home and with a zero sales tax incentive.

I'd like to welcome a former colleague and long-time Ham, Kevin McQuiggin VE7ZD, to SARC. Kevin has recently retired and is looking to become involved with our hobby again. This is great for us as Kevin brings a wealth of knowledge and experience as those who have attended his talks and workshops in the past will know.

Late news... We have once again placed #1 in Canada for Field Day 2018 in the 3A category. A very satisfying result.

Finally, you will see some minor changes happening in the newsletter and elsewhere as the membership voted to amend the Surrey Amateur Radio Club name to Surrey Amateur Radio Communications at the November meeting. The good news... we'll still be SARC!

~ John VE7TI
Communicator Editor

On the Web

ve7sar.net

Between newsletters, watch your e-mail for news, announcements of Amateur Radio events, monthly meetings and training opportunities.

Click the links below to follow our presence on the web:

SARC Blog
ve7sar.blogspot.ca

Twitter
[@ve7sar](https://twitter.com/ve7sar)

FaceBook
[SurreyAmateurRadio](https://www.facebook.com/SurreyAmateurRadio)

Our YouTube Channel
[SurreyARC](https://www.youtube.com/SurreyARC)

SARC Photo Albums
Web Albums

or
tinyurl.com/SARCphoto

Tweet Others As You Want To Be Tweeted—Anonymous

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The Rest Of The Story...

David Edward Hughes

Really The First To Transmit Radio?



David Edward Hughes

David Edward Hughes (16 May 1831 - 22 January 1900), was a British-American inventor, practical experimenter, and professor of music known for his work on the printing telegraph and the microphone.

He is generally considered to have been born in London but his family moved around that time so he may have been born in Corwen, Wales. His family moved to the U.S. while he was a child and he became a professor of music in Kentucky. In 1855 he patented a printing telegraph. He moved back to London in 1857 and further pursued experimentation and invention, coming up with an improved carbon microphone in 1878. In 1879 he identified what seemed to be a new phenomenon during his experiments: sparking in one device could be heard in a separate portable microphone apparatus he had set up. It was most probably radio transmissions but this was nine years before electromagnetic radiation was a proven concept and Hughes was convinced by others that his discovery was simply electromagnetic induction.

Hughes was born in 1831, the son of a musically talented family hailing originally from either London or Corwen, Denbighshire, and emigrated to the United States at the age of seven. At only six

years old, he is known to have played the harp and English concertina to a very high standard. At an early age, Hughes developed such musical ability that he is reported to have attracted attention of Herr Hast, an eminent German pianist in America, who procured for him a professorship of music at St. Joseph's College in Bardstown, Kentucky. Hughes also worked as a practical experimenter, coming up with the printing telegraph in 1855. He moved back to London in 1857 to sell his invention, and worked on the transmission of sound over wires. He worked on microphones and on the invention of the induction balance (later used in metal detectors). Despite Hughes' facility as an experimenter, he had little mathematical training.

Printing telegraph

The Hughes telegraph, was the first telegraph printing text on a paper tape; this one was manufactured by Siemens and Halske, Germany (Warsaw Muzeum Techniki)

In 1855, Hughes designed a printing telegraph system. In less than two years a number of small telegraph companies, including Western Union in early stages of development, united to form one large corporation — Western Union Telegraph Company — to carry on the business of telegraphy on the Hughes system. In Europe, the Hughes Telegraph System became an international standard.

Microphone

In 1878 Hughes published his work on the effects of sound on the powered electronic sound pickups, called "transmitters", being developed for telephones. He showed that the change in resistance in carbon telephone transmitters was a result of the interaction between carbon parts instead of the commonly held theory that it was from the compression of the carbon itself. Based on its ability to pick up extremely weak sounds, Hughes referred to it as a "microphone effect" (using a word coined by Charles Wheatstone in 1827 for a mechanical sound amplifier). He conducted a simple demonstration of this principle of loose contact by laying an iron nail across two other nails connected to a battery and galvanometer. His paper was read before the Royal Society of London by Thomas Henry Huxley on May 8, 1878 and his new "microphone" was covered in the July 1 edition of Telegraph Journal and Electrical Review. Hughes published his work during the time that Thomas Edison was working on a carbon telephone transmitter and Emile Berliner was working on a loose-contact transmitter. Both Hughes and Edison may have based their work on Philipp Reis' telephone work. Hughes would refine his microphone design using a series of "carbon pencils" stuck into blocks of carbon to better pick up sound but never patented his work, thinking it should be publicly available for development by others.

The Hughes telegraph, was the first telegraph printing text on a paper tape; this one was manufactured by Siemens and Halske, Germany (Warsaw Muzeum Techniki)

Invention of radio

Hughes seems to have come across the phenomenon of radio waves nine years before they were proven to exist by Heinrich Hertz in 1888. In 1879 while working in London Hughes discovered that a bad contact in a Bell telephone he was using in his experiments seemed to be sparking when he worked on a nearby induction balance. He developed an improved detector to pick up this unknown "extra current" based on his new microphone design and developed a way to interrupt his induction balance via a clockwork mechanism to produce a series of sparks. By trial and error experiments he eventually found he could pick up these "aerial waves" as he carried his telephone device down the street out to a range of 500 yards (460 m).

On February 20, 1880 he demonstrated his technology to representatives of the Royal Society including Thomas Henry Huxley, Sir George Gabriel Stokes, and William Spottiswoode, then president of the Society. Stokes was convinced the phenomenon Hughes was demonstrating was merely electromagnetic induction, not a type of transmission through the air. Hughes was not a physicist and seems to have accepted Stokes observations and did not pursue the experiments any

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In 1878 Hughes published his work on the effects of sound on the powered electronic sound pickups, called "transmitters"



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Elihu Thomson put forward a claim that Hughes was really the first to transmit radio

further. A connection with Hughes phenomenon and radio waves seems to show up 4 years after Heinrich Hertz's 1888 proof of their existence when Sir William Crookes mentioned in his 1892 Fortnightly Review article on Some Possibilities of Electricity that he had already participated in "wireless telegraphy" by an "identical means" to Hertz, a statement showing Crookes was probably another attendee at Hughes' demonstration.

Hughes did not publish his findings but did finally mention them in an 1899 letter to The Electrician magazine where he commented that Hertz's experiments were "far more conclusive than mine", and that Marconi's "efforts at demonstration merit the success he has received... the world will be right in placing his name on the highest pinnacle, in relation to aerial electric telegraphy". In the same publication Elihu Thomson put forward a claim that Hughes was really the first to transmit radio.

Hughes' discovery that his devices, based on a loose contact between a carbon rod and two carbon blocks as well as the metallic granules in a microphone that exhibited unusual properties in the presence of sparks generated in a nearby apparatus, may have anticipated later devices known as coherers. The carbon rod and two carbon blocks, which he would refer to as a "coherer" in 1899 is also similar to devices known as crystal radio detectors.

The Royal Society

Hughes was elected a Fellow of the Royal Society in June 1880, and won their Royal Medal in 1885. After Hughes' death the Hughes Medal was created by the Royal Society in his honour, to be awarded to other scientists "in recognition of an original discovery in the physical sciences, particularly electricity and magnetism or their applications". It included a gift of £1000 and was first awarded in 1902.

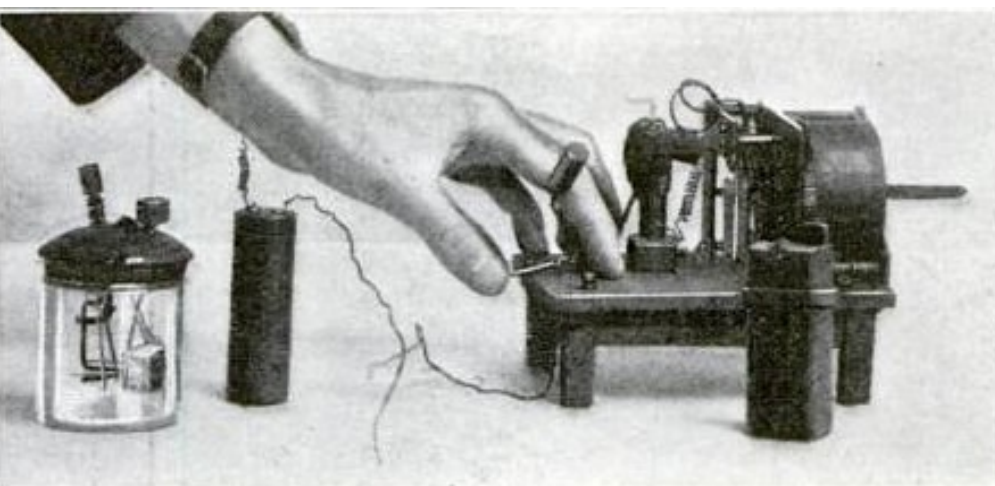
Death

Hughes died in London and was buried in the Egyptian vaults at Highgate Cemetery. His wife Anna Chadbourne Hughes was buried with him.

In his will he left the greater part of his property (£473,034) to a trust fund, to be distributed between the four London hospitals, the Middlesex Hospital, the London Hospital, the King's College Hospital and the Charing Cross Hospital. He also left bequests to the Institute of Electrical Engineers, the Société Internationale des Electriciens, the Royal Society, the Académie des Sciences de l'Institut, and to the Royal Institution of Great Britain.

And that is the rest of this story.

Hughes wireless apparatus, a clockwork driven spark transmitter and battery (right) and a modified version of his carbon block microphone (left) which he used in his 1879 experiments.





Back to Basics

John Schouten VE7TI

From The Canadian Basic Question Bank

This month we'll look at Ohm's Law. Ohm's law states that the current through a conductor between two points is directly proportional to the voltage across the two points.

B-005-4-4

How is the voltage in a DC circuit calculated when the current and resistance are known?

1. Voltage equals current divided by resistance
2. Voltage equals resistance divided by current
3. Voltage equals power divided by current
4. Voltage equals current multiplied by resistance

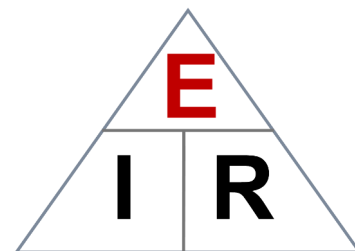
There are quite a few questions in the Canadian Basic Question Bank related to Ohm's Law, and series/parallel circuits, which we will look at in more depth in subsequent articles.

The most fundamental law in electricity is Ohm's law or $E=IR$. The E is for electromotive force (voltage), which means the potential difference between two charges. In other words, it is a measurement of the work required to move a unit charge between two points. When we see a value such as 10 Volts, it is a measurement of the potential difference between two reference points.

The law was named after the German physicist Georg Ohm, who, in a treatise, described measurements of applied voltage and current through simple electrical circuits containing various lengths of wire. Ohm explained his experimental results by a slightly more complex equation than the modern form in the right margin.

In January 1781, before Georg Ohm's work, Henry Cavendish experimented with Leyden jars and glass tubes of varying diameter and length filled with salt solution. He measured the current by noting how strong a shock he felt as he completed the circuit with his body. Cavendish wrote that the "velocity" (current) varied directly as the "degree of electrification" (voltage). He did not communicate his results to other scientists at the time, and his results were unknown until Maxwell published them in 1879.

Ohm did his work on resistance in the years 1825 and 1826, and published his results in 1827 as the book *Die galvanische Kette, mathematisch bearbeitet* ("The galvanic circuit investigated mathematically"). He drew considerable inspiration from Fourier's work on heat conduction in the theoretical explanation of his work. For experiments, he initially used voltaic piles, but later used a thermocouple as this provided a more stable voltage source in terms of internal resistance and constant voltage. He used a galvanometer to measure current, and knew that the voltage between the



*The Ohm's Law Triangle
Cover the value you are
trying to solve...*

$$E=I \times R$$

$$R=E/I$$

$$I=E/R$$

*Yes, you too **can** pass
the Basic exam!*



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thermocouple terminals was proportional to the junction temperature. He then added test wires of varying length, diameter, and material to complete the circuit.

Voltage

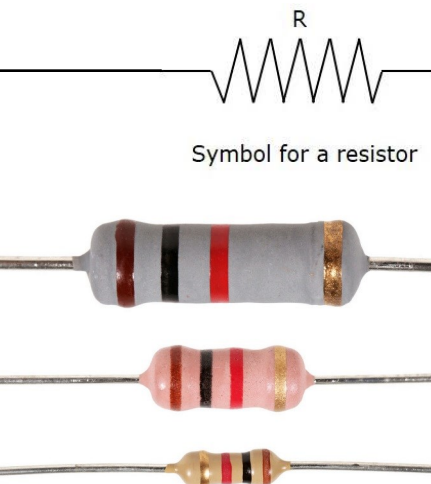
Normally the two points will be between a positive voltage and 0V (also known as ground), but it can also be the difference between +5V and -5V, +20V and +10V, etc.

Current

The next component of Ohm's law is current, the units of which are Amperes; in the formula, current is represented by the very illogical choice of the letter I. As mentioned previously, current is the measurement of the flow of charge in a circuit.

Resistance

This leaves us with the letter R which represents Resistance. Electrical resistance, measured in Ohms, is the measure of the amount of current repulsion in a circuit. Simply, resistance resists current flow. When electrons flow against the opposition offered by resistance in the circuit, friction occurs and heat is produced. The most common application for resistance in a circuit is the light bulb. The light bulb introduces enough resistance in a circuit to heat up the filament inside, causing light to be emitted. Resistance in a circuit can also be helpful when needing to alter voltage levels, current paths, etc. Resistors are self-contained packages of resistance that can be added to a circuit and are commonly used to divide voltage levels.



So resistors are circuit elements that impede the passage of electric charge in agreement with Ohm's law, and are designed to have a specific resistance value R. In a schematic diagram the resistor is shown as a zig-zag symbol. An element (resistor or conductor) that behaves according to Ohm's law over some operating range is referred to as an ohmic device (or an ohmic resistor) because Ohm's law and a single value for the resistance suffice to describe the behavior of the device over that range.

Ohm's law holds for circuits containing only resistive elements (no capacitances or inductances) for all forms of voltage or current, regardless of whether the driving voltage or current is constant (DC) or time-varying such as AC. At any instant of time Ohm's law is valid for such circuits.

Resistors which are in series or in parallel may be grouped together into a single "equivalent resistance" in order to apply Ohm's law in analyzing the circuit. More about this in another article.

Therefore, for the answer to our sample question at the top of this article we look at Ohm's Law, where I is the current through the conductor in units of amperes, E (electromotive force) is the voltage measured across the conductor in units of volts, and R is the resistance of the conductor in units of ohms. Our triangle shows that, to find voltage, we multiply current and resistance, so $E=I \times R$. Therefore the answer to our sample question is:

4. Voltage equals current multiplied by resistance

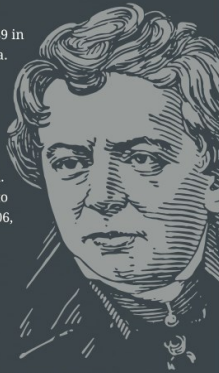
~ 73, John VE7TI

Ohm's Law

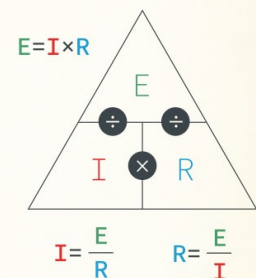
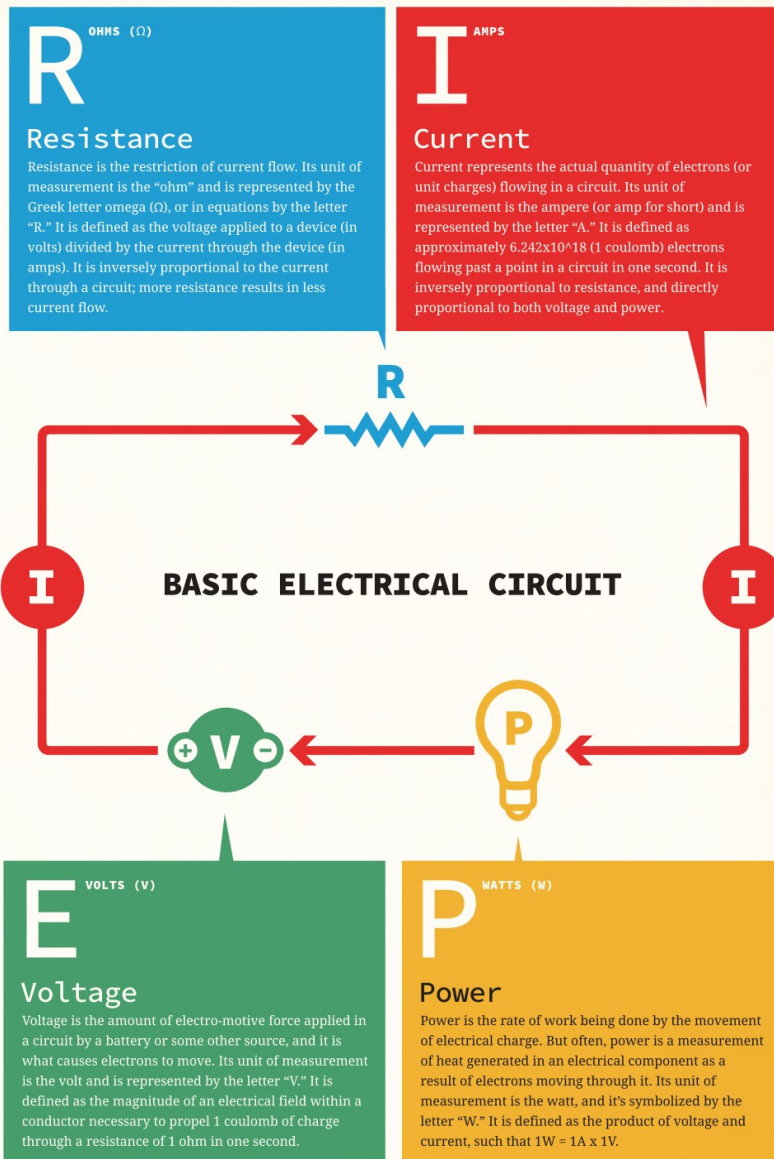
Ohm's Law represents the most basic understanding of how electricity works. It is a very simple set of equations that describe the relationships between voltage, current, resistance and power in an electrical circuit. A firm understanding of Ohm's Law can take you very far in electronics, and is one of the first principles taught to engineering students.

The Father of Resistance

Georg Ohm was born in 1789 in the city of Erlangen, Bavaria. One of three surviving children in a family of nine, Georg spent much of his youth in frivolous pursuits such as dancing, ice skating and playing pool. Georg's father sent him off to school in Switzerland in 1806, where he could more effectively focus on his studies, eventually becoming an accomplished professor of mathematics and physics. In 1827, Georg wrote his seminal work, *The Galvanic Circuit Investigated Mathematically*, in which he expounds upon the nature of electricity and what would ultimately become known as "Ohm's Law." Like many forward thinkers, his work was not immediately accepted by mainstream academia, but was taken as proven before his death in 1854 at the age of 65. <https://www.famousscientists.org>



From beginner kits to advanced prototyping, and everything in-between, get started at **sparkfun.com**



Solve for Whatever

Using the simple equations in the chart, you can easily calculate the values of any two of the critical circuit parameters, given any other two known factors.

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How to use an SWR meter



Electronics Notes has just launched a new page on “How to Use an SWR Meter.” As there are many misconceptions and myths about SWR, we have tried to look at the topic and detail how to use an SWR meter and also how to interpret the results.

The page details what an SWR meter is, the various ways in which an SWR meter can be used, with and without an ATU, and then it looks at interpreting the results. A step by step guide of making SWR measurements is also included.

Not always does a good SWR reading mean that everything is working well, and in this page with its associated video we try to provide a straightforward and informative explanation about using SWR meters and what to look for.

Read the full story at:

<https://www.electronics-notes.com/articles/antennas-propagation/vswr-return-loss/how-to-use-vswr-meter.php>

Watch the video:

<https://youtu.be/qSea5FjcTDE>

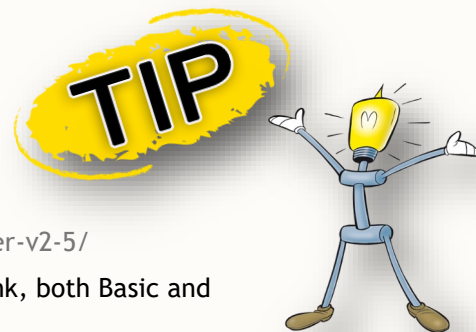
Study Links

Whether you are new to the hobby or brushing up on skills, you should find these study links helpful:

1. RIC-7 is the entire up-to-date Industry Canada (IC) Basic Question Bank.
<http://tinyurl.com/CanadaBasicQB>
2. There is a RIC-7 that has some explanations along with the questions.
RIC-7 2014rev08.05 with explanations.
3. The Amateur Radio Exam Generator is at:
https://www.ic.gc.ca/eic/site/025.nsf/eng/h_00040.html
4. The ExHaminer Study software for Windows is at: <https://wp.rac.ca/examiner-v2-5/>
5. The Ham Study website has a flash card approach to learning the Question Bank, both Basic and Advanced. It is at: <https://hamstudy.org>

Contact SARC if you wish to write the Basic or Advanced Exam. If you pass we'll even give you a year's free SARC membership!

Newly Licensed? When you receive your paper license in the mail, it will come with a form that can be filled out and mailed to the Radio Amateurs of Canada office, at which point an introductory RAC one-year membership will be set up. Introductory memberships are identical to our existing basic memberships and you will receive the The Canadian Amateur magazine for one year.



Wire Snippets

Using \$25 worth of equipment to chase signals from cubesats which are the size of a coffee can. Project completed a homemade antenna with \$5 worth of materials and a \$20 RTL SDR receiver. Did it work? You be the judge!

<https://www.youtube.com/watch?v=t5pihYcRWPA>

I am making 10m DX contacts one after another. Zero sunspots but working DX on FT8! Is FT8 creating a "tipping point" for amateur radio at the very bottom of the solar cycle?

<https://www.flexradio.com/ft8-tipping-point-for-ham-radio/>

A Ham's Night Before Christmas:

This has been around for a while but "T'is the season..."

<https://www.youtube.com/watch?v=ailFghtEKsc>



AMSAT-DL President Peter Gülzow DB2OS reports on a new amateur radio satellite forum that aims to help newcomers become active on the satellites.

On the AMSAT Bulletin board (AMSAT-BB) he writes:


We have set up a new online forum at <https://forum.amsat-dl.org/> Especially with the upcoming launch of P4-A / Es'hail-2 we want to offer a forum for extensive discussions.

Essentially this is a forum, where everyone can report on experiences and knowledge from operating satellites and thereby help other newly interested radio amateurs to become active and a member of our satellite community.

Of course all topics around amateur radio satellites and OSCAR's should be discussed there, appropriate categories and forums were created. If necessary this can be extended at any time and on request.

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Sun	Mon	Tue	Wed	Thu	Fri	Sat
	<div>For details on all SARC events, go to ve7sar.net</div> <div>For details on all SEPARS events, go to separ.shutterfly.com/calendar</div>					1 08-1000 SARC Social: Kalmar Family Restaurant King George Blvd & 81st Avenue
2	3	4 1930 SEPAR Net 2000 SARC Net	5	6	7	8 SARC Christmas Lunch 11AM
9	10	11 1930 SEPAR Net 2000 SARC Net	12 No General Meeting	13	14	15 08-1000 SARC Social: Kalmar Family Restaurant
16 CONTEST: ARRL Rookie Roundup CW	17	18 1930 SEPAR Net 2000 SARC Net	19	20	21	22 08-1000 SARC Social: Kalmar Family Restaurant
23/30 30 CONTEST: RAC Winter contest SSB- CW	24/31	25 	26 Boxing Day	27	28	29 08-1000 SARC Social: Kalmar Family Restaurant CONTEST: RAC Winter contest SSB-CW

Contest Details: <http://hornucopia.com/contestcal/contestcal.html>



Page 13—News You Can Lose

The Lighter Side of Amateur Radio

Ham Op 3rd Most Popular Costume This Past Halloween

By K5KAC, on the scene and in costume

Middletown, Conn. — According to Venture Costumes, a Halloween costume retailer, Sexy Nurses and Teen Zombies had better watch out. “If you follow our market data, there is a significant, wide-spread interest in dressing up like a Ham Radio Operator for Halloween, and we want to meet that demand,” said CEO Matt Larr.

The company has rolled out its much-researched “Ham Kit” in time for trick-or-treating and wild office parties. “I spent a lot of time with a scanner listening to local repeaters. I even snuck into a few club meetings to really get into the belly of the beast. I was horrified and bewildered,” noted Evie Christian, lead costume designer for Venture. “In my opinion, I think I’ve come up with a great, terrifying product.”

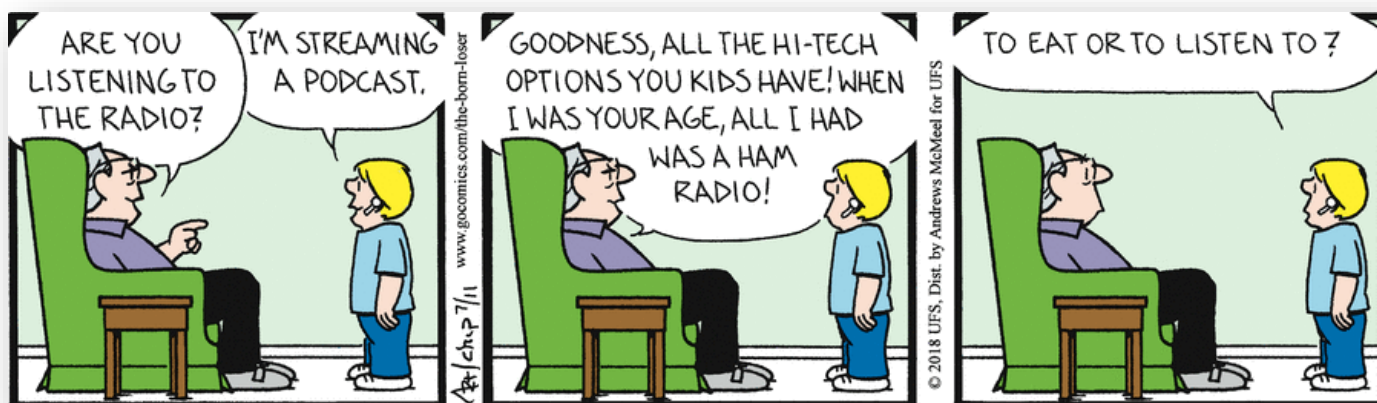
Venture’s “Ham Kit” comes bundled with clothing, hair/beard dye, and accessories. The clothing portion includes a pair of off-orange Crocs, a pair of “broken-in” sweatpants, “LET’S FREQ!” novelty shirt, and a pair of rose-tinted glasses. Accessories include a Beofunger plastic HT with open squelch effect, blood glucose monitoring kit, LED callsign badge and



embroidered callsign hat. A bonus “Ham Musk” spray which promises to “Bring Terror to the Senses!” is available for \$5.99.

At press time, there were talks of a possible “Sexy Ham” novelty costume for women, however Venture’s creative team was having issues bridging the gap between the two concepts. The Ham Kit will be available at department stores soon with a MSRP of \$31.00 USD.

~ Ham Hijinks



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At The Last SARC Meeting

November General Meeting Minutes

Wednesday, November 14, 2018

Location: Emergency Management BC

Meeting Start Time: 7:03pm

Attendees: 29

Welcome

President Stan Williams VA7NF welcomed everyone and explained that we have two meetings tonight, the first being a special general meeting to discuss a club name change plus some bylaw changes, and the second, a regular general meeting.

Special General Meeting

Stan called for any proxy votes that people may have tonight.

Proxy Registration

Stan Williams had 1 proxy from Rick Law.

Don Hamilton had 1 proxy from Stewart.

John Brodie had 5 proxies from David Sinclair, Don Dangelmaier, Paul Piovesan, Robert Fishwick and George Merchant.

Name Change

Discussion about the name change took place with several points raised from the floor.

Stan moved that the Surrey Amateur Radio Club change its name to Surrey Amateur Radio Communications and notify Victoria (Societies Act of British Columbia) accordingly.—Motion carried unanimously.

Bylaw Changes

John Brodie VA7XB reviewed changes to the constitution and bylaws on the

overhead projector. Previously these changes were sent to the membership via email for review.

Four changes were presented:

1. *"Surrey Amateur Radio Club" changed to Surrey Amateur Radio Communications"*
2. *The word "Club" to be replaced by the word "Society" wherever it appears.*
3. *"Purpose" changed to include "or through public service wherever radio communications may be required"*
4. *Cheque signing authority changed from "President or Treasurer" to "Treasurer and one other member of the Executive".*

Stan moved that bylaw changes be made as presented in the notice of motion (via email).—Motion carried.

Rob Gilchrist VE7CZV moved that we adjourn the SGM. Seconded by Don Hamilton.—Motion carried

== Coffee Break ==

The general meeting started at 8:12pm

Announcements

Stan/Scott have some patches/badges available for sale, the last of their kind.

Financial Report

Scott provided the monthly financial details.

Health and Welfare

Nothing to report (good news)

Christmas Dinner

Jinty Reid VA7JMR: Asked if anyone has not yet received the invitation to the Christmas Dinner. Some new members requested the invitation be re-sent. The Christmas Luncheon is Saturday December 8th 11am-2pm at Guildford Golf and Country Club 7929 152nd St. Surrey. Please pay Scott or via PayPal on the website (include a note that payment is for the Christmas Party). Please also RSVP Jinty Reid at jinty.reid@gmail.com. The price per person is \$25 before Nov 30th, or \$30 thereafter.

Operations and Training Centre (OTC)

John: \$8,250 was the amount of our grant from BC Lottery. An invitation will be sent out for an OTC Committee meeting on Sunday 1pm. Agenda:

1. Spending of grant
2. Upgrading of triplexers
3. Raising another wire antenna for 80m or 40m

Les Tocko VA7OM has repaired our triplexers. Thanks to Les.

Field Day

Stan: A FD Coordinator is needed for 2019.

December QST apparently shows SARC as 1st in Canada for 3A (to be confirmed).

Contesting

Stan: VECTOR is having a VHF contest Nov 17/2018

<https://vectorradio.ca/post/2018/nov-17-vhf-qso-party/>

John: Last weekend 4 members participated in the Worked All Europe RTTY Contest at the OTC. Conditions were poor into Europe but the team managed 417 contacts for 82,000 points.

Upcoming contests are the CQ WW DX CW contest November 24/26th and then the

RAC Winter Contest Dec 29th

<https://www.cqww.com/>

<https://wp.rac.ca/rac-canada-winter-contest-rules-2018/>.

Auction

Sheldon Ward VA7XH: We've had 21 bidders register for the auction site so far and things are working well. Expect to see 5 different items each week appear on the site. Items that have not met the reserve will be reposted the following week.

Membership

John: The membership list for the year has been finalized, and we currently have 86 paid members + 29 ham class freebies for a total of 115 members.

Communicator

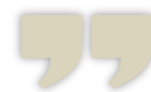
John Schouten VE7TI reminds us that he's always looking for articles written by our members. Articles can also be recommended by others so please send suggestions to John communicator@ve7sar.net. We are also always looking for members to have their profile written up for the Communicator.

New Business

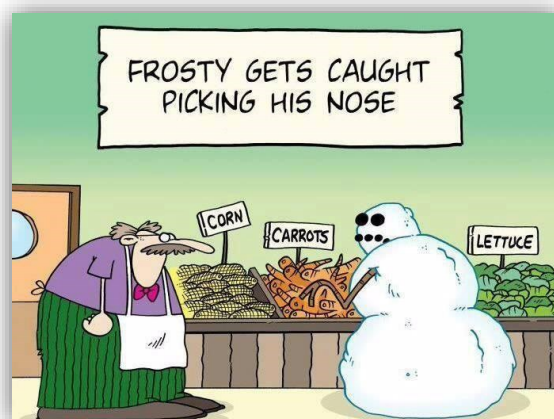
Don Dangelmaier (absent) VA7AB was asking if anyone is familiar with Yaesu FTM-400dr fusion radio. He was very impressed with it at the JOTA event.

Meeting Adjourned: 8:59pm

~ Jeremy VE7TMY



*The December QST
apparently shows
SARC as 1st in
Canada for 3A*



December 2018

Operations & Training Centre News

John Brodie VA7XB

Decisions!



Most SARC members know that in October we had a failure of our new linear amplifier, which was found to be the result of a faulty tank coil, according to Bob Hardie W5UQ of Expert Linears who conducted the repairs under warranty. The turnaround was fast, and we were able to get the amp back in service within a few weeks (thanks to Bob for his efficient service).



Since then we have used the amp in two contests operating at high power, without any problems. This equipment is a breeze to use: it reads the frequency from the CAT connection with the transceiver and changes bands accordingly,

connects to the correct antenna, doesn't need tuning once it has been pre-programmed, and adjusts the exciter power to the correct level, all without operator intervention. A multitude of alarms and power-back features deliver a high level of protection. It is currently paired to the IC-7610 which is itself a fine state-of-the-art SDR.

We have more good news to share this month: Our most recent community gaming grant application was successful and, although we did not get the full amount requested, the grant is sufficient to allow us to continue with our station upgrading at the OTC.

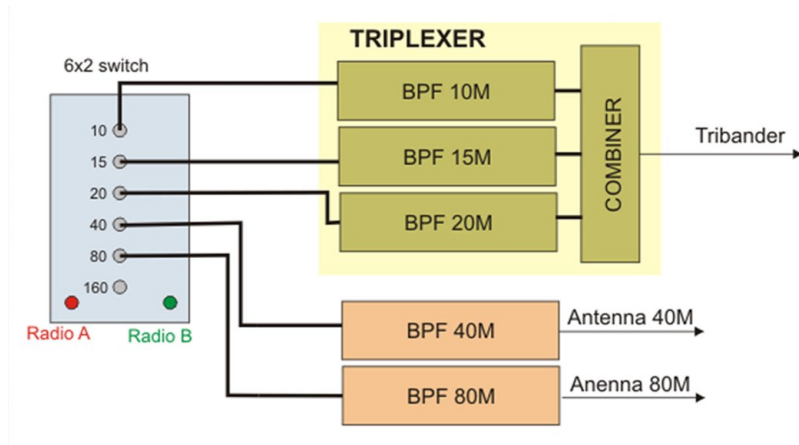
With the reduced grant, the list of intended acquisitions was reconsidered at a meeting of the OTC Committee on Nov.

14th at which time the decision was made to drop the Powergenius amplifier from our wish list temporarily, based on a consensus of priorities by the committee. The group will be reviewing remaining items and the inclusion of new ones over the next few months with a view to how best to meet the long-term objectives for the OTC.

It has been noted in this column previously that low band triplexers purchased from Dunestar have failed repeatedly even when never used above 100 watts. The last time this occurred, the units were sent back to Dunestar for repairs, however one of units returned to us continued to malfunction, so we decided to repair the units ourselves.

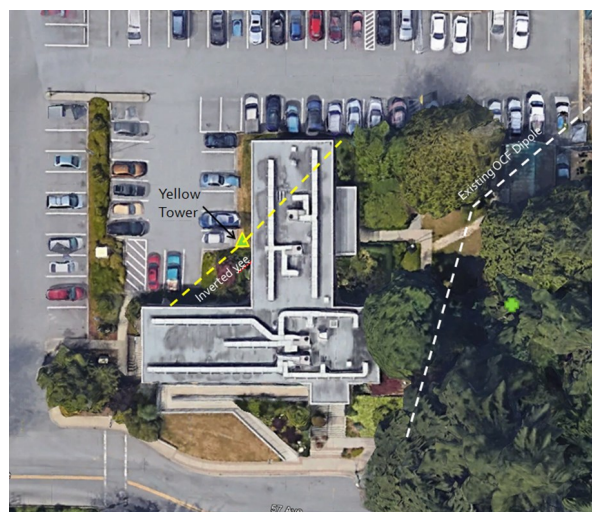
A big thank you to Les Tocko VA7OM, who stepped up and completed the repairs. As further discussed elsewhere this Communicator, Les confirms that the Dunestar low band triplexers are deficient in both design and performance.

As part of the long-range plan for the OTC, the decision of the OTC Committee has been made to replace the triplexers and bandpass filters in stages, consistent with the demands of our high power equipment. The first step will be to replace the 10-15-20 m triplexer and bandpass filters. Then later we will likely do the same for 40 and 80 m. The final step will be to install remote antenna switching. The block diagram [next page] illustrates these concepts [thanks to 403A for use of this graphic].



The committee is now considering erecting a 40 m inverted vee to supplement the multi-band OCF dipole currently in use. The proposed configuration would look like the overhead view [right]. Addition of this antenna will move us further along in our capability of having two high power stations which can operate simultaneously without mutual interference. Adequate bandpass filtering of antenna feeds is critical to such a plan.

~ 73, John VA7XB



Ham radio helps maintain cognitive skills

ABC News reports Amateur Radio is helping lifelong hobbyists stay mentally fit in old age. It comes with all the benefits of social media but without "any of the downsides" — and one of Australia's oldest ham radio enthusiasts says it is also the perfect hobby for retirees looking to stay mentally sharp.

West Australian-based Norman Gomm VK6GOM took to ham radio over forty years ago and now aged 82 has no intention of signing off just yet. As one of Australia's estimated 10,500 licensed ham radio operators, Mr Gomm, is also the president of the Bunbury Radio Club.

He says it is rare that a day goes by without him spending at least a couple of hours in his purpose-built 'ham shack'. "I find it's very good for me," Mr Gomm told the ABC amid a dazzling display of flashing lights and crackling radio static. "I'm 82 years of age and you need to keep your mind working actively all the time," he said. "Ham radio requires a lot of cognitive skills and a lot of understanding technology, so I find that's very good for keeping me active."

Watch the video and read the full story at:

<http://www.abc.net.au/news/2018-06-27/ham-radio-helping-older-hobbyists-stay-mentally-fit/9908468>

December 2018



Tidbits from the Amateur Radio World

World Wide Flora and Fauna in Amateur Radio

I write to inform the Amateur Radio Operators (HAMS) and Shortwave Listeners of BC about changes coming to the park lists of the World Wide Flora and Fauna in Amateur Radio.

WWFF encourages amateur operators to activate either portable or mobile from natural settings such as National Parks, Provincial Parks and other outdoor settings. Awards can be earned by activators, and listeners.

Listeners fall into two categories - licensed hams who complete a QSO with a park activator and shortwave radio listeners who cannot complete a contact.

Please review the WWFF in Amateur Radio website if you are not familiar with it. It is at <http://wwff.co/>. Canada participates using the identifier VEFF and it's web page is at <https://www.qsl.net/va3rj/veff.html>. To view the current map of all the parks in your area play around with the map at <https://www.cqgma.net/mvs/index.php>.

Change the city from Amsterdam to your city and province and hit locate, then click the yellow highlighted WWFF and select VE Canada from the dropdown list. It will zoom you to the East coast but you can scroll back easily to BC. Click on a Maple Leaf to learn about the park.

Early in each year the participating nations in WWFF are able to update their list of spots to activate by an addition of 500 parks. 160 of the 500 Canadian parks added this year will be in British Columbia.

VEFF encourages both the amateur radio hobby and the enjoyment of the natural splendour of British Columbia. I acknowledge that some parks in B.C are a real challenge. They can be both a challenge to get to and then a challenge to make any contacts. I recently spent several hours on the shores of Cultus Lake in Cultus Lake Provincial park and managed only 2 - one in Chilliwack and one in Tokyo Japan, both on 20m SSB.

Good luck with your activating!

~ Bob Riley VE7FPK

SARC Items for Sale To Members

SARC has purchased 3 different styles of type 31 ferrite cores which have been used for RFI/common mode current suppression at the OTC. Unused cores will be available for purchase by members at cost as follows. These are all Type 31 material, all \$CDN with local pickup; the prices are:

- Solid beads 25.9 OD, 12.8 ID, 28.6 long (Fits over RG8 type coax) \$2.25
- Split core/snap on size as above \$4.00
- Large diameter 61.0 x 35.6 x 12.7 (5 turns RG8 with connector) \$7.25

The Contest Contender

John Brodie VA7XB

December Contests



Two contests in November are now behind us: the Worked All Europe (RTTY) and the CQ WW DX (CW) contests.

The WAE had one serious drawback - Europe was tough to work, given the zero sunspot conditions in which we find ourselves; 20 m was open to Europe from our part of the world only for a couple hours on Saturday and Sunday morning, then almost nothing later on. This is one contest where the East Coast has a decided advantage as Europe is a short distance across the pond for them. Good thing that the RTTY version of this contest allows contacts anywhere or things would have been even slower. Participants in the WAE were: Slawa VE7LWW, Robert VA7FMR, Sheldon VA7NL and John VA7XB. Our claimed score was 81,732 for 417 contacts on 4 bands. As expected 20m got most of the action.

The CW contest was a different story. Europe was open for noticeably longer hours in the morning, but in addition, activity was intense on all bands with contacts into most of the world at some time during the day or evening hours. A lot of it has to do with the ease of CW to be copied under high noise and poor propagation conditions. Grey line contacts into Southeast Asia (Vietnam, Indonesia and Malaysia) at our sundown (and their sunrise) were especially noteworthy. For this contest our claimed score was 642,671 for 1201 contacts made by Slawa VE7LWW, Jan VA7VJ and John VA7XB.

In December we can look forward to the RAC Winter Contest on Dec. 29, where we will encourage members to help out SARC in the mode of their choice for this one-day event. This contest is an ideal opportunity to polish operating skills, in readiness for the BC QSO Party in February and Field Day in June.

The following item is thanks to Jim Smith VE7FO. Here's a tip for testers, both novice and advanced, wanting to improve their skills. The ARRL has a semi-monthly newsletter called "The ARRL Contest Update" with all kinds of contest related tips.

The current issue includes a link to <http://ku7t.org/automate-starting-and-exiting-multiple-programs/> which shows you how to set up a profile for any particular contest and will, at the touch of a button, load all the programs required for the contest and in the right order. e.g. N1MM+, N1MMrotor.exe, (I think that's the right name), VE7CC, DXAtlas, VOACap, Ionoprobe, Athena, etc. Could also be very useful for managing the Club station.

Among several other articles is one on "How to Adapt your DX Contest Strategies for Low Solar Activity". There is also lots of general contesting news.

The ARRL Contest Update is published every other Wednesday (26 times each year). ARRL members may subscribe at no cost or unsubscribe by editing their Member Data Page as described at <http://www.arrl.org/contests/update/>.

~ John VA7XB



December 2018



Profiles of SARC Members

Chris Cowx VA7CWX

I was born in Vancouver, British Columbia, and raised in Langley with a younger sister and two younger brothers. Our father passed away when we were all very young. I have lived in the Lower Mainland for my whole life except for three years when my wife, son and I moved to Prince Edward Island for a short contract through my work. Our adventure to the East Coast will always be one of the most memorable times in all of our lives. I have a basic education but have taken several courses though out the years that have been work related or other forms of adult education. I have been a sheetmetal technician for the last 30 years and the last 19 of those has been in the aerospace industry as a leadhand, fabricating and repairing helicopter parts.

Chris Cowx
VA7CWX

radios from Canadian Tire. We soon found out that you can't always stay in a small group. The trails get longer and the trucks are more spread out when there are larger groups or when the trails become more difficult. The lack of communications led me in search of something better. Ham radio was the answer and I soon realized that the hobby had so much more to offer. I have always been intrigued with electronics and this new found communications method captured my interest. It wasn't long before our Jeep was outfitted with a multi band mobile and I had a few hand held radios on a shelf.

Some of the best moments I have had on the radio was listening to Big Ben on New Years Eve one Saturday afternoon in my garage and the excitement of hearing my call sign returned from the ISS on a Field Day just a few years ago. That QSL card was my first ever and I am happy that I could share that moment with other hams in my community. The radio operators in our surrounding communities are so much more than just acquaintances. We all rely on each other for community events that we volunteer for and share our experiences and teach one another our skills. The best parts of amateur radio for me now is being able to help others and I really enjoy the aspect of emergency preparedness. I have been a member of the Surrey Amateur Radio Club since I received my license in 2011 and I am now in my third year as the president of the Langley Amateur Radio Association. I am involved with the Langley Emergency

My interest in amateur radio began with the necessity to communicate. My family and I have been involved in off-roading around BC and the Maritimes. The ability to communicate in small groups on the trail is easily handled with a good CB radio or even a few small FRS



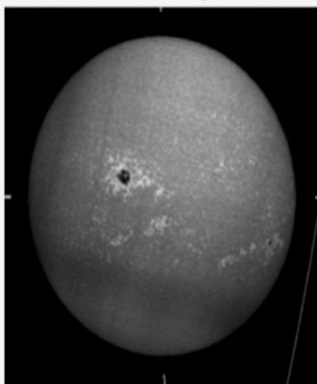
Preparedness group and their communications team. I also volunteer as one of the directors for the Langley Good Times Cruise-in and many other events in our community throughout the year. When time permits, I plan to continue to enjoy the hobby of amateur radio and to spend more time off road and camping with my wonderful wife. Thank you for considering me for this issue of the communicator.

~ 73 Chris Cowx VA7CWX

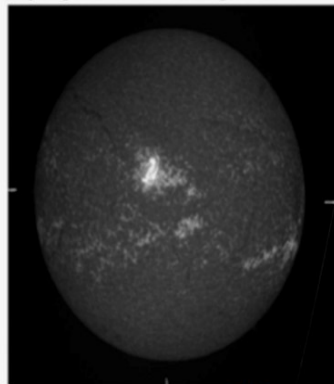


A BLAST FROM THE PAST (WARTIME SPACE WEATHER IN VIETNAM): On Aug. 2nd, 1972, giant sunspot MR11976 began to explode. For the next 2 days it unleashed a series of [X-class](#) flares, causing deep radio blackouts on Earth and punishing the solar panels and onboard electronics of satellites in Earth orbit. One CME (cloud of plasma) rocketed across the sun-Earth divide in only 14.6 hours—a record that still stands today. Resulting geomagnetic storms sparked auroras so bright, they cast shadows in countries as far south as Britain.

a) Calcium Emission, 3 August 1972



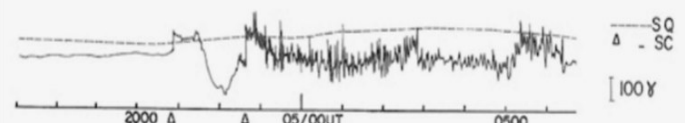
b) Hydrogen- α Emission, 4 August 1972



Above: Images of giant sunspot MR11976 from the Paris Observatory. [\[more\]](#)

The 1972 solar storm is legendary at NASA because it occurred in between two Apollo missions: the crew of Apollo 16 had returned to Earth in April and the crew of Apollo 17 was preparing for a moon landing in December. If the timing had only been a little different, astronauts could have been sickened by radiation, requiring an emergency return home for medical attention.

Turns out, it's legendary in the Navy, too. According to [a research paper](#) just accepted for publication in the journal *Space Weather*, declassified Naval archives reveal an extraordinary explosion in the sea lanes near Vietnam: "On 4 August (1972) TF-77 aircraft reported some two dozen explosions in a minefield near Hon La over a 30-second time span...Ultimately the Navy concluded that the explosions had been caused by the magnetic perturbations of solar storms, the most intense in more than two decades."



Above: A magnetogram from Manila reveals unusual disturbances on Aug. 4-5, 1972. [\[more\]](#)

December 2018

Surrey Emergency Program Amateur Radio



The SEPAR Report

Roger Andrews VA7VH - SEPAR Coordinator

December News

This is just a quick update to let everyone know that things are happening on the Surrey/SEPARS/SARC front. John Brodie VA7XB from SARC, John VE7TI and myself met back on October 16th to discuss the best way for both SEPARS and SARC to move forward. Gord VA7GK came on board a short time later thereby creating a small executive team. The goal of this executive team is to find a happy and constructive integration (I did not say amalgamation) of the two groups that can become something that SFS will be happy to support. This is in the very early stages and other than that, I can only report that discussions we have had, have been constructive and teamwork is certainly not a problem.

I want to thank Gord VA7GK for stepping up and helping with this. He's filled the void that I have temporarily left because of my personal issues. Because of his connections to e-Comm, he's also succeeded in getting some things done that I was unable to. Thanks Gord!

VA7ITJ - Jason has also been very helpful by stepping up as Secretary, but even more-so with some hardware management, and that deserves thanks.

SEPAR Annual Competition

As of last April, we started a competition that active SEPAR members can participate in. The most active member will win an MD390 DMR Radio package. You can checkout pictures of the radio and see the rules on <http://va7.ca/radio> (an interim website).

If you are not now a member, we'd love to have you on-board. Contact me at the link above.

Weekly Nets

Every Tuesday evening at 1930 hrs (7:30pm PDT) we start a ½ hour NET on a local repeater provided by the Surrey Amateur Radio Communications (SARC) on 147.360 MHz +600kHz and a tone of 110.9. There November be a simplex test or a test NTS message transmitted during the NET at the Net controllers discretion. This is an excellent opportunity to practice sending and receiving this form of messaging. Besides, it adds a little spice to the regular check-ins on the net. Please join us. NTS Radiograms can be found on the SEPAR website here, or, if you would like a fillable PDF that you can enter on your computer, you can get it from here.

Thursday nights at 19:30 hours, This Net has changed! We are no longer doing a regular 2 meter simplex Net on this night. Any plans for Thursday night will be announced on the Tuesday before. This night will now be used for optional tests. For example NTS Digital exchanges, 6 meter, 2 meter 60 cm and 220 Nets. If someone wants to do a particular net on a Thursday, then please announce it on the Tuesday before.

~ Roger VA7VH
SEPAR Coordinator

ARES

ARES training focuses on health and welfare traffic and generally requires the operators to be proficient in message handling using the NTS protocol. In most jurisdictions the numbers of volunteer amateur radio operators are small and therefore cross training is standard. To be proficient in handling messages, regardless of the type of message, amateur radio operators must have radio room operation training. To walk into a radio room, turn it on, assign roles and tasks, and interact with the Incident Commander is a top priority for all amateur radio volunteers. There is a distinct difference between the station manager training level and the radio operator training level and this applies to all radio room operation regardless of the type of traffic being handled. As RAC has a pretty good training program for ARES members it appears that this would be a benefit to all amateur radio emergency communications training.

EMBC has a very good station management course that many have taken over the years. Hopefully it can be made available to all SEPAR amateur volunteers in the very near future.

Our Field Day Result

The 2018 Field Day results are in!

We scored #1 in Canada and 60th overall in our class.



Rank	Call	Score	Cate- gory	QSOs	Partici- pants	Club
1	VE7SAR	4,602	3A	893	25	Surrey ARC
2	VE7SCC	3,052	3A	925	9	Coquitlam ARES Soc.
3	VE7MIR	1,638	3A	82	25	
4	VE7VVC	1,180	3A	114	40	VECTOR Vancouver
5	VE7CMR	1,162	3A	150	8	Maple Ridge ARC

Name	Frequency	Offset	CTCSS
VE7RSC (Primary Repeater)	147.360	+0.600	110.9
VE7RSC (Secondary Repeater)	443.775	+5.0	110.9
VE7RPT (Primary Regional Repeater)	146.940	-0.600	
Optional 136.5 Rcvr			
Simplex 1	(VHF)	146.550	
Simplex 2	(VHF)	147.420	
Simplex 3	(UHF)	446.550	
Simplex 4	(UHF)	447.425	

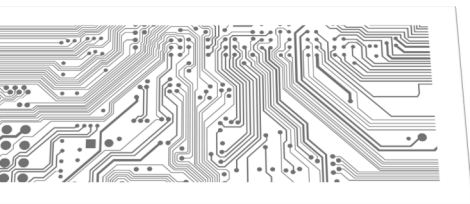
Other frequencies in the Greater Vancouver area:

Primary: Coquitlam/Abbotsford	146.430
Primary: Inter-Municipal Group 3	146.445
Primary: Vancouver; Mission; Sec. Coquitlam	146.460
Primary: Kent-Mission; Sec. Richmond	146.475
Primary: Inter-Municipal Group 2	146.490
Primary: New West; Sec. Richmond	146.505
National Calling / FM Simplex Group I	146.520
Primary: North Shore; Port Coquitlam	146.535
Primary: Bowen Island; Surrey	146.550
Intermunicipal Group 1 Coordination	146.565
Primary: Lions Bay/Vancouver/Delta/Langley	146.580
Primary: Port Moody; Sec: Burnaby	146.595
Secondary: Vancouver/Surrey	147.420
Secondary: Vancouver (UBC) / Maple Ridge	147.450
Primary: White Rock/Chilliwack; Sec. No. Shore	147.480
Secondary: Burnaby/Pitt Meadows	147.510
Primary: Delta; Sec: Abbotsford	147.540
Primary: Hope; Sec: Delta; ALSO EMBC	147.570



Surrey Emergency Program Amateur Radio

December 2018



TECH TOPICS

Daniel Romila VE7LCG

Review Of An SDR Dongle

SDR = software defined radio

Having already a conversation with VE7TI (John) about an older generation of SDR dongles I felt compelled to buy a new one, in 2018, a much smaller one, also from China. Most probably what I bought is a knockoff of a NooElec micro dongle. It was in sale at the time, for \$7.87 CAD, shipping and taxes included, from aliexpress.com. It came with a remote control, an antenna and a CD with drivers. I discarded all those accessories, which are totally unusable if somebody wants to use the SDR dongle as a general receiver, and not as a DVB-T PC adapter, as intended.

I would like to start my review by underlining exactly that, the SDR dongle I am reviewing was not designed to be a general receiver, as I use it.

My first action was to install it on the computer, on a USB port, and to install drivers and software for it. I followed the instructions from www.rtl-sdr.com. It is tricky to have the drivers work in Windows 10, but if the instructions are followed exactly as in the given website, it works.

competitor is HSDR, which does not know how to decode stereo FM. All other programs I tried partially worked (they do not know all modulations types, have unclear settings, and so on).

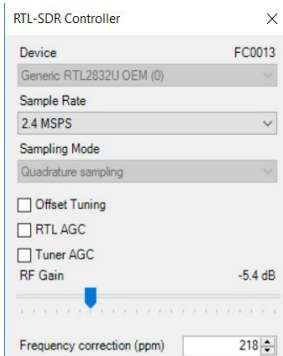
- It has to be connected on the USB computer port with an extender, otherwise the electric noise generated by the computer makes it unusable, completely deaf for useful radio signals. I used my own accessories, in order to adapt the MCX antenna connector from the dongle to my antennas:
- Caging the SDR dongle does not help much; if it is not case to case to the electric noise generator, but several centimeters apart, it is fine. I tried to cage it in metal and it did not make any difference in various test situations. I suspect it is already somehow shielded or partly shielded inside.
- In the commercial FM band it is a cheap stereo and more important, a RDS (radio data system) receiver. It knows how to display the name of the station, the songs that are played at that moment and whatever digital info the station sends in addition to the analog signal. The sensitivity in FM is way worse than 2 microvolts. Any dedicated commercial receiver-amplifier, including my roommate's Yamaha 2 microV, every single FM radio in the apartment we have, including clock radios, and MP3 portables (the radio part) are more sensitive than the SDR dongle. I am using a proper horizontal dipole antenna on the balcony measuring 71 cm each leg, connected with coax cable to the SDR dongle, while all other 7 receivers have just a small piece of

Some conclusions

- The only software that completely works in Windows 10 is SDR sharp. It has various useful plugins, like a plugin for detecting the CTSS tones. Many plugins do not work with the last version of SDR sharp. It is free. A close



wire as antenna. I estimate the sensitivity in the 88 - 108 MHz band somewhere at 30 microvolts. It is expected the SDR dongle would be less sensitive in the FM band, due to the wide frequency bandwidth. I limited the bandwidth from 250 KHz to 180 KHz and there was a slight improvement.

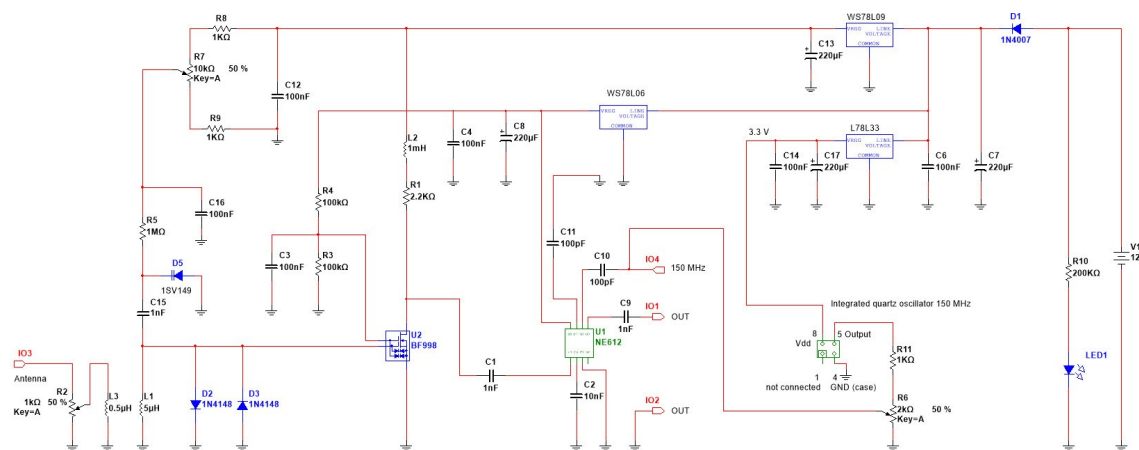


- The sound in the FM band is not great. Even at 250 KHz, wide band FM (maximum in SDR sharp program), has audio quality that is just bearable. This is not exactly acceptable. I will not replace any of the radios with this SDR dongle, even though it displays data.
- The characteristics differ very much on the Rx bands and require adjustment at the RTL dongle settings. That means RF Gain; RTL AGC; Tuner AGC.
- It is stable. I did not feel the need for a more stable oscillator. It did require adjustment in the software, 218 ppm as in the above picture for my dongle. This is considered a huge adjustment. I verified this with encapsulated quartz oscillators (32 MHz, 125 MHz, 150 MHz, the 28.197 CW beacon), and indeed it needs that huge adjustment.
- It seems it does not like the 50 MHz band, and the sensitivity is not great in this band. I confirmed the poor reports as everybody writing about this issue on the Internet experienced the same result, although I hear some local ham radios almost every evening. They never say their callsigns, so I just presume they are ham radios since they are in a ham band.
- On the 144 MHz band, with a good dipole, it receives everything the Kenwood 7950 and the Chinese walkie-talkie receives. It likes this band and it has a good sensitivity. All repeaters from Victoria, Port Angeles, Nanaimo, and Cowichan are 59. Probably the path is more important than the sensitivity in this case, too. I am at 103 meters above sea level. There are some images for strong local repeaters.
- It also likes the marine band, air traffic band and the weather band. They are all around 150 MHz and once the settings are done for one station, they can be kept for the weather, marine, 2 meter bands.
- The CB band and the beacon on 28.197 MHz (VE7MTY, Pitt Meadows, continuous, CW) are in a band where the RTL dongle is not so sensitive. The beacon (nearby me) booms in on my SONY ICF7600G portable radio, with its telescopic antenna. The SDR dongle with a CB whip on the balcony receives it almost OK, but only because I was hunting for the beacon and I knew where it was. The beacon's signal barely produces a trace in the display spectrum, and I am nearby it (exactly 13.89 km).
- There are images everywhere. The FM band (88 - 108 MHz) can also be received on 30-50 MHz. The worse thing to do is to use an upconverter, as I saw so many do on the Internet, with a NE612 integrated circuit, and wide non-tuned input. I tried, and the images kill any useful signal. In the end I did 2 converters, in order to cover 3.5 MHz to 30 MHz, one for the lower part and one for the upper part. I used an NE612, attached to an amplifier with a BF998 in front. I have a tuning circuit just at the antenna, and a 2.2K resistor + coil in the output of the BF998's drain. The source terminal is connected directly at the ground and the BF998 is supplied with 9 Volts (12 V is max in the datasheet, and it does burn after 12 V). The oscillator is an encapsulated 3.3 V powered oscillator, in a socket, to easily change it. The best the dongle worked for me is in the 150 MHz band, to stay away from the FM commercial band and to upconvert the shortwave into a sensitive band that the SDR dongle likes. I can adjust the signal from the oscillator to the value from the NE612 datasheet, but it actually does not make any difference, even if it is attached with 2 Volts (NE612 has a buffer in it before the mixer).

[See the schematic next page]

- The noise of the first element in the SDR dongle must be better than that in the BFR91A. I tried a wide range untuned amplifier with one BFR91A, and it did not bring anything new, just noise.

December 2018



The situation changed when I put a SAW 88 - 108 MHz (3 pin filter) in front of the BFR91A, and it helped.

- It does not run hot. Whatever other users noticed with old SDR dongles is no longer an issue with my 2018 SDR small dongle.



Final conclusions

- The SDR dongle is the cheapest 2 meter receiver a Ham can buy, and works as receiver on par with dedicated equipment, which is generally limited by line of sight, not by sensitivity. A beginner can listen to the weekly nets for some \$8-11 CAD, shipping and taxes included.
- The SDR dongle is the cheapest FM commercial RDS receiver one can have, capable of displaying the digital data continuously and transmitted by almost all stations in Vancouver.
- The SDR dongle was not meant as a general coverage receiver. It was designed as a DVB-T television European standard receiver, and it is probably better for that purpose.

~ Daniel VE7LCG

A Postscript...

In the NI Multisim schematic you see a LED with a big resistor in series. It is not a mistake.

All LEDs I use are from China. The 3 mm ones I bought extremely cheap (I think they were 200 or 500 in the bag). The white ones are the most sensitive, and light at several microamps. I need to use resistors between 150 K (for BLUE) and 300 K (for WHITE) in series with the LEDs for 12 Volts power supply.

Now I understand what kind of LEDs they use in the portable lit antennas for walkie-talkies they sell for Baofeng. They light OK. Smaller resistances means burned LEDs. I tried the old values from various published schematics, and NO, they are not OK for the bags of LEDs I have.

SOLDER SPLATTER

Daniel Romila VE7LCG

An Inexpensive Mini Light Organ

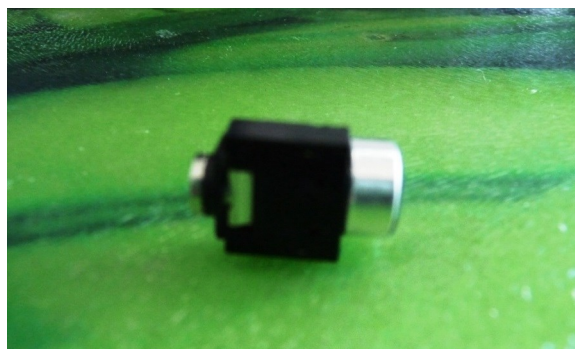
Playing on EchoLink I realized that at home I have only USB microphones. I still had some small 5mm diameter capsule electret microphones. It was high time to make an investment in some electret microphone capsules of at least 9 mm diameter, just to have some on hand.

I confess I never considered paying a dime for luxury components like those sold by other hams on Craigslist, being older than me, full of rust (more than me) and costing a fortune. No! I bought new ones, from aliexpress.com. I paid \$2.24 CAD, shipping and taxes included, for 20 pieces. They were so expensive because I wanted the microphone capsules to already have some wires soldered to them, otherwise I would have bought 40 of them with the same money. Yeah, no luxury antiques from other hams here.



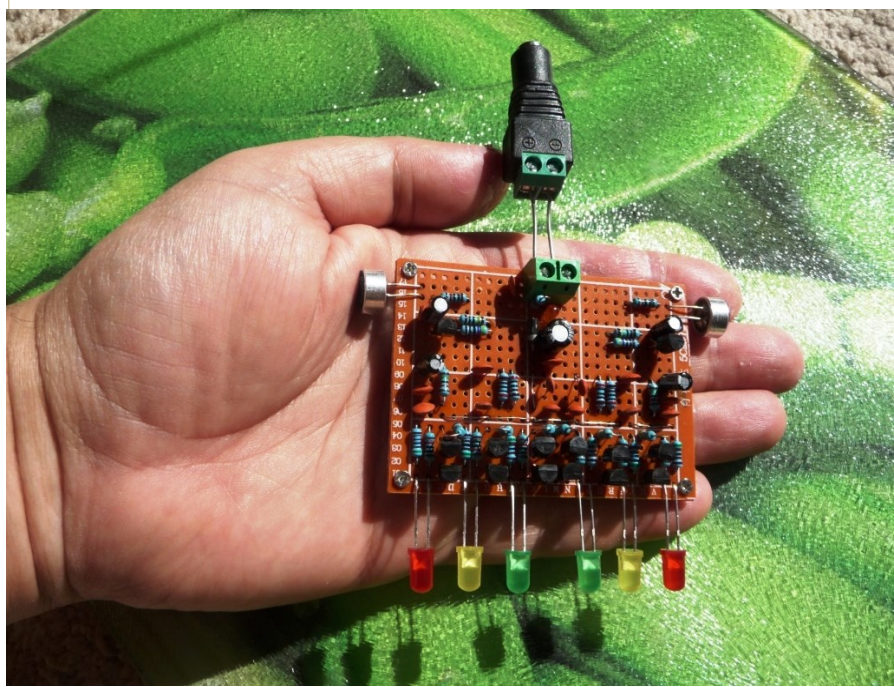
When I received them I immediately tried one on my computer. The GND of the capsule was soldered to the GND of a corresponding headphone jack. The hot terminal of the microphone was soldered to the hot left wire of this headphone jack. The computer knows to generate the required voltage.

Here it is:



It works and - while it was meant just as test, I even use it. I additionally flooded my soldering with plastic glue. It looks like it is an industrial product. And it works OK.

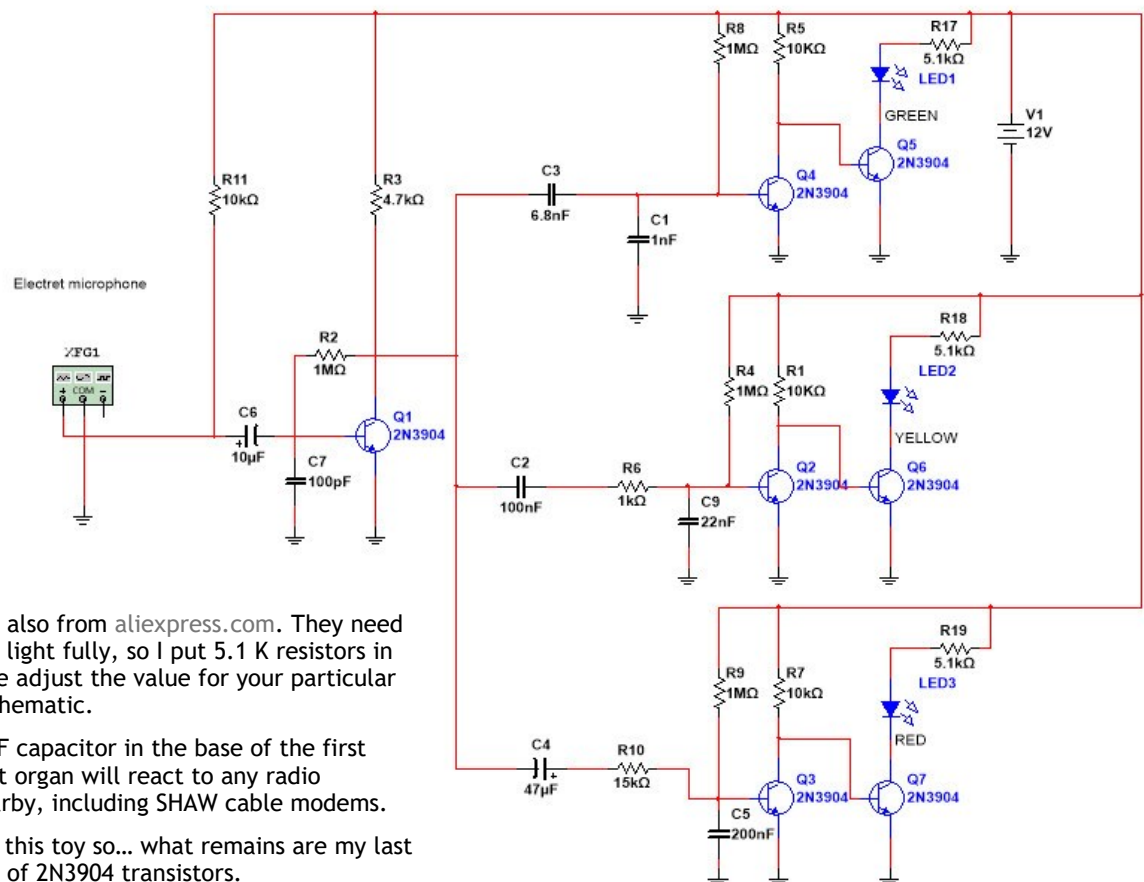
I had already made some light organs with big lamps. This time I wanted to quickly do a LED organ, only with 2N3904 BJT transistors. I also wanted it to be STEREO, very small, and not to require any external adjustment. So, I decided on the schematic, but first I simulated it on the computer to have minimal surprises on the PCB. The final product looks like this:



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The final schematic (shown only for one channel)



Note: I used 5mm LEDs, also from [aliexpress.com](https://www.aliexpress.com). They need less than 2 milliamps to light fully, so I put 5.1 K resistors in series with them. Please adjust the value for your particular LEDs if you build this schematic.

Do not forget the 100 pF capacitor in the base of the first BJT. Without it the light organ will react to any radio frequency you have nearby, including SHAW cable modems.

I used 14 transistors for this toy so... what remains are my last 500 pieces from my bag of 2N3904 transistors.



RAC supports Canadian National Parks on the Air event (CNPOTA): January 1 to December 31, 2019

<https://wp.rac.ca/rac-supports-canadian-national-parks-on-the-air-event-cnpota/>

Radio Amateurs of Canada is pleased to announce its support of the Canadian National Parks on the Air (CNPOTA) event which will be held next year from January 1 to December 31.

The CNPOTA Event Committee describes the event in this way:

“All Radio Amateurs worldwide will have an opportunity to operate portably from any of Canada’s 48 National Parks and 171 National Historic Sites (these are ‘activators’). Amateurs around the world will be able to chase these adventurous operators in an effort to confirm the most QSOs (these are ‘chasers’).

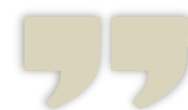
Activity for activators and chasers will be tracked on a dedicated website and real-time leader board and other statistics will be available throughout the year. Activators and chasers will be able to compete for and collect online awards and certificates created specifically for the event.

Come join the fun and plan to visit one of Canada’s beautiful Parks and Historic sites next year!”

RAC will be assisting the organizers in promoting the event through articles in The Canadian Amateur magazine, the RAC website and in social media.

For more information about the event please visit the Canadian National Parks on the Air website at: <https://cnpota.ca/>

~ Alan Griffin
RAC MarCom Director



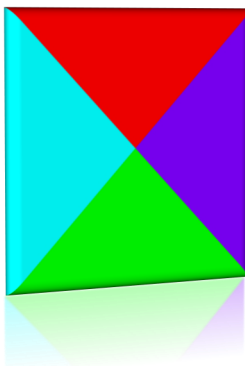
RAC will be assisting the organizers in promoting the event...



The Radio Amateurs of Canada (RAC) magazine ‘The Canadian Amateur’ (TCA) November-December issue is now available to members on-line.

For membership information, please visit: wp.rac.ca

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Foundations Of Amateur Radio

VK6FLAB Onno Benschop

Episode 173: Is man-made noise really vertical?



*For the audio
podcast:
Foundations of
Amateur Radio
- Episode 173*

One of the often repeated attributes of noise and antennas is that man-made noise is vertically polarized and that is why a vertical antenna sounds noisier than a horizontal dipole. It's an interesting thing to say, but is it true?

Let's start with what constitutes man-made noise. Cars driving past, solar panel inverters, pool pumps, high-tension power lines, garage door openers, broadband internet modems, LED lights, lawn mowers, leaf blowers, plasma televisions and so on. The more you think about this, the more noise makers you discover.

So, are these noise sources all aligned in the same way, making the same noise?

Clearly not. There is no alignment standard for installing a lamp, how to align your lawn mower, which direction to drive, what angle to point your garage door opener, so the statement that man-made noise is vertical is clearly bogus.

That doesn't mean that the rest of the statement is also wrong. A vertical antenna in an urban environment often sounds much noisier than a horizontal one, sometimes by several dB.

So what's going on?

One suggestion is that the difference lies in the antenna itself. What if both noise sources, horizontal and vertically polarized were the same, but the antenna heard them differently, how would that look?

For starters, a horizontal dipole has a higher sensitivity at a higher angle than a vertical antenna does. So anything arriving at a low angle is picked up by the vertical, but not by the horizontal dipole.

The noise that we're talking about is local, we'll get to why in just a moment. Being local, it gets to the antenna via ground wave propagation rather than via the ionosphere. I claimed that the man-made noise we're discussing is local. It's not all local, but if it's remote, it's coming via the ionosphere and we know that it arrives at whatever angle it pleases, so there is little or no difference between a vertical and a horizontal dipole from a noise perspective for signals arriving via the ionosphere.

There is another effect. Attenuation or signal loss. In this case loss of strength. Specifically noise strength. More attenuation is the same as more signal loss.

Combining ground wave propagation and attenuation brings us to another difference between a horizontal and a vertically polarized noise source. A horizontally polarized ground wave experiences more attenuation than a vertical one. This means that noise that is local travels further and is louder when it's vertical, compared to when it's horizontal, sometimes the difference is over 20 dB.

I've been talking about horizontal and vertically polarized noise, but what if the

noise is coming at an angle, like the random noise makers around you? A simple way to think of it is that every angle has a horizontal and a vertical part, in much the same way as a right-angle triangle has three sides, one horizontal, one vertical and one on an angle.

Putting this all together, we have a number of different effects, all conspiring to make the vertically polarized part of noise travel further, be louder and received better by a vertical antenna, compared to the horizontally polarized part which doesn't travel as far, is softer and heard less by a horizontal dipole.

One more thing. The isolation between vertical and horizontal polarization can be as much as 40 dB, so a horizontal dipole won't hear vertically polarized signals well if at all and vice versa.

That doesn't make the vertical antenna useless, far from it. It's great for transmitting a long distance signal, it's small, simple to set-up and if you're in a quiet area, away from noise makers, around 500m to a kilometer or so, it's just fine as an antenna. It also doesn't need to be erected half a wavelength above the ground, doesn't

need any sky-hooks, is omni-directional and in common use for most local mobile communications, so don't write off the vertical, just because it sounds noisier.

All antennas are a compromise between various elements. I've said it before and I'll say it again, likely plenty more times beyond that. The perfect antenna does not exist. We can prove that, so what ever you pick, what ever you think is the most important, that's what you'll start with and select various aspects as you go.

A vertical antenna is no worse than a horizontal dipole, it's different. Just like a Yagi is different, or a discone, or any one of the infinite supplies of antenna options. Knowing what the parameters are is the first step.

Oh, and if your neighbours complain about your lawn, tell them it's because of your noise-floor.

~ Onno VK6FLAB



Episode 174... Random bits of wire

One topic that is longer than all other topics combined is that of antennas. Designing, planning, sourcing, building, tuning, using, you name it, all of this is regular fare in the day of a radio amateur. I've discussed the topic here regularly and no doubt I'll revisit that when the mood or necessity takes me.

One topic that is rarely discussed is that of failure.

About six months ago I moved house. I've been rebuilding my shack, doing all manner of fancy shuffling of gear and yesterday I finally got to the point of getting some HF activity happening. During that process I went through boxes and boxes of stuff, with coax, connectors, wire, nuts, bolts, heat shrink and all the other necessities of being a member of an experimental hobby like ours.

One box contained wire. You know the adage, only two types of wire required in our hobby, cheap wire or free wire with a preference for free. This box was stuffed with wire. Bits with connectors, bits wound around spools, bits in zip-loc bags with labels, bits of random length - lots of bits of random length.

There was even an abortive attempt at labelling dipoles for various bands on the outside of a couple of zip-loc bags, but no idea if the bit of wire in the bag was actually ever tested and resonant on whatever band was on the label, so who knows, they might have just been cut long waiting for another day and another set of experiments and measurements.

I needed around 50 meters of hook-up wire for my HF antenna experiment and it occurred to me when I was hunting through my box that I

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To listen to the podcast, visit the website: <http://podcasts.itmaze.com.au/foundations/> and scroll to the bottom for the latest episode. You can also use your podcast tool of choice and search for my callsign, VK6FLAB.

All podcast transcripts are collated and edited in an annual volume which you can find by searching for my callsign on your local Amazon store, or visit my author page: <http://amazon.com/author/owh>.

Foundations of Amateur Radio Volume 7 is out now - with chapters on digital modes, coax connector loss, waterfalls, station performance and more.

Feel free to get in touch directly via email: onno@itmaze.com.au, or follow on twitter: @vk6flab (<http://twitter.com/vk6flab/>)

If you'd like to join a weekly net for new and returning amateurs, check out the details at <http://ftroop.vk6.net>, the net runs every week on Saturday, from 00:00 to 01:00 UTC on Echolink, IRLP, AllStar Link and 2m FM via various repeaters.

ITmaze -ABN: 56 178 057 063

phone: 04 1219 8888
onno@itmaze.com.au

couldn't look at a spool and tell you how much wire there was. I did a dodgy measurement of one bit, put it on the kitchen scales and determined that another spool was heavier, so it was likely longer, but without bringing in my calculator, doing extra measurements and doing some head scratching there was no way that I was going to get to the point of knowing how much actual wire was on that spool.

In the end I made do with the dodgy piece, soldered some joins, that's a whole other adventure, involving a gas-powered soldering iron and a flame, the flame won, as well as several other breaks and fixes.

While I was in the process of putting up my new antenna experiment it occurred to me that part of the process of experimentation, even of shack maintenance should be the documentation stage.

I have bits of terminated coax, some of it 20 meters long, some longer, some shorter. How much longer, and how much shorter you ask? No idea. But wouldn't it be great if I could put my hands on a piece of kit that I needed that was the length that I expected and not 10 meters over length, or 1 meter short.

In my audio kit, I have started labelling patch leads with their functions, using key-ring tags. I don't expect that to work for plain wire, but it should be a good solution for coax. I could use cable tie labels, but past experience with those leaves the text fading on the label. I've experimented with a printed label with clear heat shrink, but for reasons best known to chemists, the clear heat shrink becomes yellow in short order leaving the label unreadable.

I've heard of people using electrical tape with colour coding, perhaps one ring for every 5 meters of length, but they seem to come undone in the dust when you go camping.

One thing I do know is that this is a recurring problem for me. This is the first time I've actually stopped to talk about it and perhaps it means that I'll get a little closer to a solution.

I'd love to hear what you do to deal with this.

~ I'm Onno VK6FLAB

History Makers Podcast - Wireless Communications

Dr Lucy Rogers M6CME is joined by comedians Bec Hill and Harriet Braine for the History Makers podcast, exploring modern technology and the people throughout history who have made it all possible.

In episode one, the trio discusses whether wireless communication is our salvation or damnation. Dr. Lucy explains how Wi-Fi works, "robot" Harriet uses her databanks to bring some makers to life and Bec tells us why we should have never moved on from plastic cups and a piece of string.

So set your ears to receive and your mind to blown for History Makers episode one!

Listen to the Podcast at

<https://www.rs-online.com/designspark/history-makers-podcast-episode-one-wireless-communications>

ARE YOU UP FOR THE CHALLENGE?

Lighting An 'On The Air' Sign

I have a question from a Communicator reader. He has apparently scoured the Internet without success and is wondering if there is a method to trigger a 12 volt LED 'On The Air' sign when he keys his HF transceiver, but without a direct connection to the unit. I was thinking there may be enough stray RF on the feedline to rectify and then trigger a sensitive op amp, which could turn on the LEDs.

Daniel, a regular contributor wrote: "When I was in Romania and I was 14 I had such a RF activated sign. I lived in Timisoara, close to the botanical park. During that time the communist dictator Nicolae Ceausescu was paying the external debt with our food and electricity. So we remained in the dark many hours a day.

But across the street there were 3 big radio antennas. One was for 630 kHz, one for 909 kHz and one for 1404 kHz. They were installed a long time ago and the town expanded up to including the Radio Timisoara terrain. Radio Timisoara always had electricity and was never taken off-air.

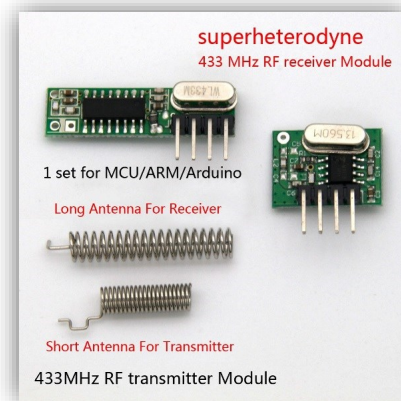
I had a 120 Watt neon tube put on the wall in my room. One of its end was connected to the water pipes. One of the opposite contacts was connected to a wire antenna between my building and the next building, some 30 meters of wire. I lived on the 7th floor. The resulting light from stray RF pickup was bright and modulated. I had to change the neon tube every month - it did not like radio frequencies."

Daniel also offered a potential solution:

"For 1.70 CAD (shipping and taxes included) one can buy a pair Rx Tx modules that can work together at 10 - 20 meters. I tested such modules. Make a device that detects RF activity at the transceiver level. Something like the spurious radiation on the coax getting out of the transceiver. Once there is such an On/Off keyed signal, transmit it with a pair of Tx/Rx modules up to the lighted LED sign. One can find all kinds of applications of those modules on YouTube."

- These modules can be different than the picture presented by the vendor on the website, This is because the coils can be printed on the PCB instead of being physically wired on top of the PCB.

- Do not count on the declared frequency. The SAW resonator can be up and down. Connect the Tx as attached and hunt for its frequency with a portable in 433 MHz. Mine is at 434.9 MHz.



Do you have the time and skills to come up with a practical solution?

If you do, we will reprint it here in the Communicator and give you the appropriate credit.

For a 'low-tech' On Air sign, see the video at:

<https://www.youtube.com/watch?v=DDg-hTP9V2M>

And a somewhat higher tech solution at:

https://www.youtube.com/watch?v=m-ST-r_fgZ0

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HARDWARE

Daniel Romila VE7LCG

The Arduino

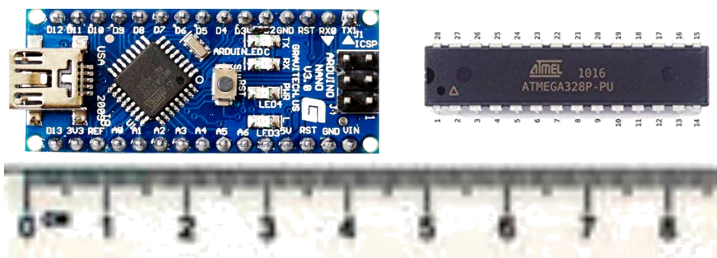
Changing the working style and comparing the size of components, versus a development board

Traditionally, microcontrollers are integrated circuits that the hobbyist buys separately, places them in a “programmer” board in a dedicated socket, and takes the programmed microcontroller out of the programmer’s board and places in its final destination board.

This is generally the point of view of a hobbyist and I am not writing about SMD (surface mounted devices) and industrial uses.

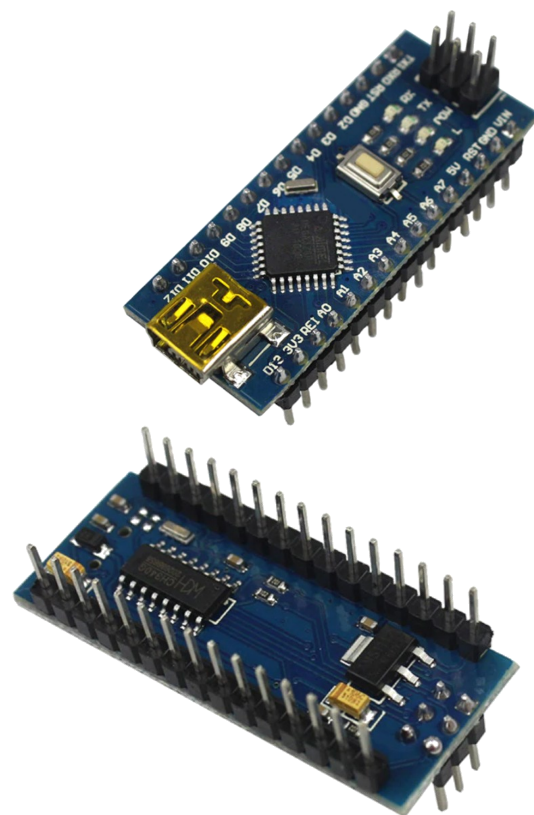
I put together an image comparing a microcontroller chip with the nano version of an Arduino board containing the same chip, in an SMD version. Because the final occupied space is pretty much the same, one wonders why you would bother buying separate integrated circuits and sockets, instead of simply just using a full development board, which contains more than the microcontroller’s pins, including the possibility of USB communication for re-programming and corrections, a RESET switch, clock and other goodies. It is just something to think about, and that makes sense in some cases, though not always. I really wanted to share this resulting picture in the newsletter, because on the Internet I could not find a size by size comparison anywhere.

The ruler is in centimeters. I merged together 3 images and I kept the scale.



An integrated chip microcontrolled ATMEL Atmega328 has 28 pins and costs around \$1.71 CAD, shipping and taxes included. An Arduino Nano development board, with the same chip, in the SMD version, plus goodies on the board, costs \$2.61 CAD, shipping and taxes included. All microcontroller’s pins are accessible on the nano development board.

~ Daniel VE7LCG



Next month Daniel has an article on building a CW Keyer using the Arduino.- Ed.

HARDWARE

John Schouten VE7TI

Using A PTT Foot Switch?

Foot switches were never a must-have Amateur Radio accessory... that is until I started contesting about 12 years ago. I used a desk mic and the built-in Push-To-Talk (PTT) switch on the mic base. It was fine for general chats. I switched to a headset sometime around 2000 and it did not have a built-in switch so I started examining alternatives.

My first trial was with a pushbutton hand switch.



It was useful but cumbersome and very unergonomic as I always had to have at least one hand on the button. Not a good choice for contesting, even with the paper logging I was using at the time.

Then I recalled my time in the E-Comm 9-1-1 call centre. Radio Operators there use a foot switch exclusively, leaving both hands open for other tasks. My first foot switch was a home-made affair. It worked just fine but did not have the right weight or 'feel' and moved around on the floor. I then modified a foot pedal from my woodworking tools by removing the AC socket and replacing it with a standard ¼-inch phone plug, the norm for PTT input.



It was much better, had decent weight and a solid PTT contact as long as my foot hit the correct part of the pedal, something that doesn't always happen in the frenzy of a good contest pile-up or an attempt to get that rare DX.

It wasn't until about 2008 that I noticed that the sustain pedal on my wife's Roland piano used a ¼-inch phone plug as well. Although I don't play myself, I found out that these are quite heavy and was told that it did not normally move around.

I used that pedal for a while but, to avoid the inevitable: "Did you take my pedal again?" I decided to shop for my own. A trip to a couple of local musical instrument stores produced several good candidates. I tried some out... to questioning stares as I didn't play a piano while doing so, but instead listened for a smooth and solid click and tossed it in the air a bit to judge the weight. I took one home for \$25 with an assurance that I could return it if dissatisfied with the product. It turned out to be a Chinese-made item but it worked like a charm with all the right attributes, and it is still in use today.

As it turned out it also has a normal open (NO) and normally closed (NC) selector switch. Apparently this is because some pianos require that option. For Amateur Radio use the switch should be set to normally open (NO) to trigger the PTT when the pedal is depressed otherwise the radio would transmit constantly except when the switch is depressed.

Amazon has pedals starting around \$20 and eBay has them starting at about \$15. My recommendation is to visit your local music store and to try a few so you can determine if they tend to slide on the floor, if they have a nice solid click and if they are normally open.

~ John VE7TI



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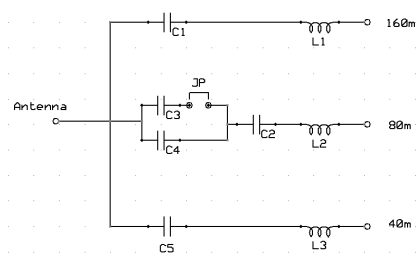
Not All Triplexers Are Equal

Les Tocko VA7OM

...Buyer Beware!

I had an opportunity to troubleshoot and repair SARC's Dunestar triplexers. A couple of surface mount capacitors failed and had to be replaced. The triplexers are now in working order again. But...

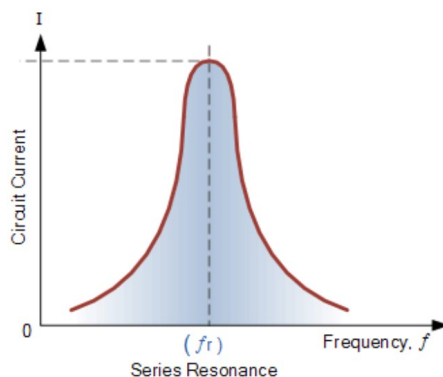
These triplexers were very cheaply made. They contain only resonant circuits instead of filters. Better diplexers have low pass filters, band pass filters and high pass filters. So why are filters better than resonant circuit? Let's see:



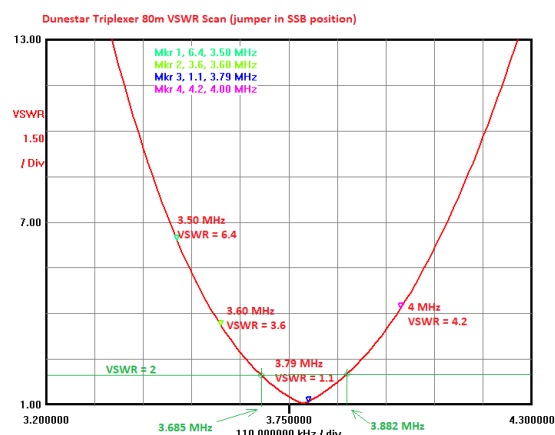
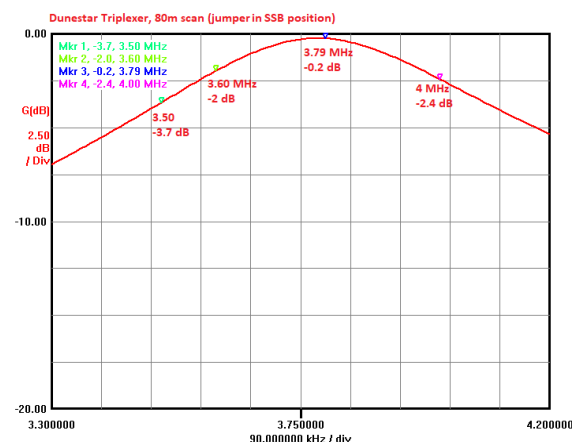
Here is a schematic diagram of our triplexer. There are 3 resonant circuits, one for 160, one for 80m and one for 40m.

The frequency response curve of resonant circuits is narrow and may not cover a whole amateur radio band. In the case of our triplexer, the 80m bandpass is so narrow that does not cover both the CW and SSB portion of the bands. There is a jumper JP that adds more capacitance (C3) for the CW band by lowering the resonant frequency. Without the jumper the circuit is tuned to the SSB band. However, the jumper is located inside of the enclosure and it is very inconvenient to change.

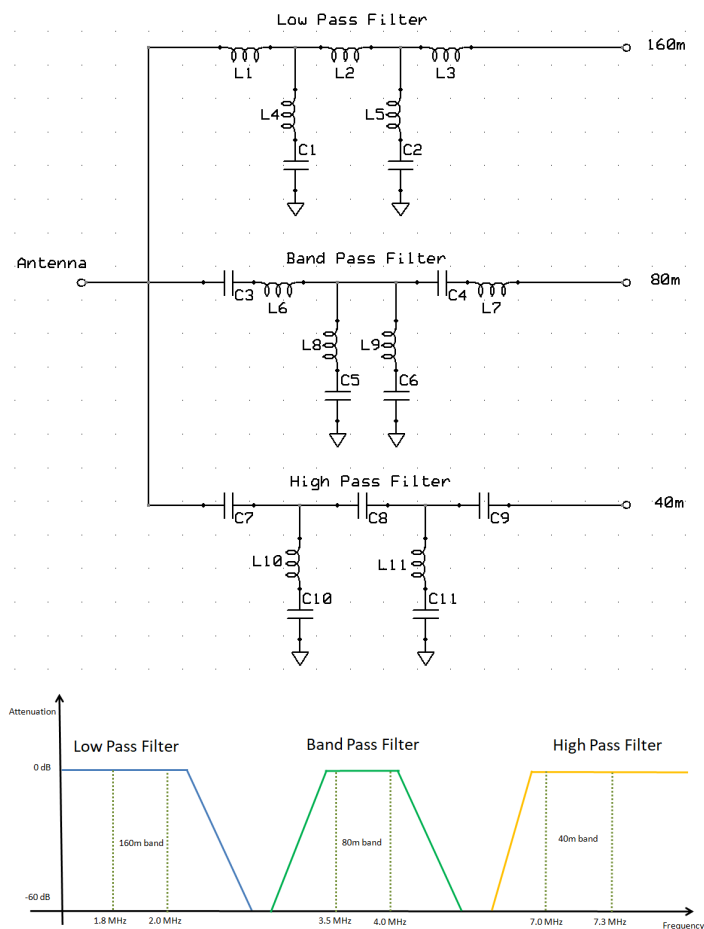
Here is a typical response of a resonant circuit over a wide range of frequencies – it has a quite narrow pass band.



Below are the 80m band graphs showing insertion loss (G) and VSWR of our Dunestar triplexer, with the jumper in the SSB position. As you can see it is useable only from 3.685 to 3.882 MHz if the practical VSWR limit is 2. It would be slightly wider if the allowable swr is 3, but it still covers only the centre of the band.



Triplexers which use filters (low, high, band pass) are much better. Below is a schematic diagram of a more sophisticated triplexer using filters rather than resonant circuits.



Let's examine the characteristics of this 80 MHz bandpass filter. The graphs [right] show the scans taken the same way as for the Dunestar units. You can see that the band pass filter is flat and covers the entire 80m band (from 3.42 to 4.10 MHz) CW and SSB without need of a jumper. The low pass and high pass filters have similar characteristics; they are flat and cover the entire 160m and 40m bands.

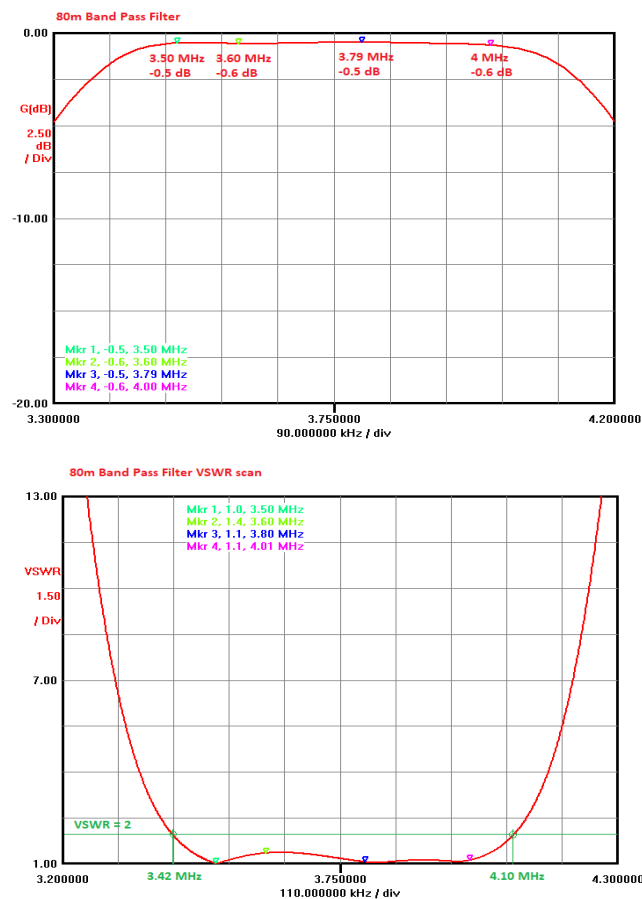
So what have we learned here?

First, you get what you pay for.

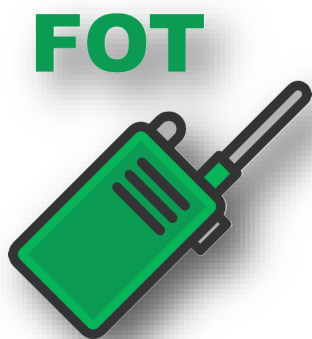
Second, you have to be careful using this triplexer because outside the narrow pass bands you will run into high VSWR. It is worthwhile to check the specifications before you purchase any triplexer.

As with any triplexer, you need to use extra band pass filters (one per band) because the isolation between the inputs is not sufficient (for example some RF power from the 80m transmitter could get into 40m receiver and damage the receiver's front end).

~ Les Tocko VA7OM



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All About...

Bob Witte KØNR

FOT: Frequency, Offset and Tone

One question we often hear from new hams (and maybe some not-so-new hams) is “why can’t I get into the repeater?” They get their hands on a new radio, set it up to use one of the local repeaters and it’s not working. Now what?

There can be a whole bunch of reasons why you can’t get into a repeater so it is difficult to come up with a quick fix for all situations. However, in this article we’ll talk about some basic troubleshooting steps to help diagnose the problem. For this article, I am assuming that your first rig is a handheld vhf/uhf transceiver but the general approach will work with mobile or base transceivers, too.

FOT

Many times the problem is due to not having the transceiver programmed correctly. The key things we have to pay attention to are: Frequency, Offset and Tone (FOT). To access a repeater you need to have its Frequency entered into your radio, have its transmit Offset set correctly and have the right CTCSS Tone turned on. You might not need to check all of these things in that exact order but it is a good way to approach the problem. Using the programming software (and suitable cable) for your radio can be a big help.

Frequency

First you need to program in the frequency of the repeater you want to access. The actual key strokes or knob turns will depend on the particular model of radio so consult your operating manual. The frequency you enter is the repeater transmit frequency which will be your receive frequency. Repeaters are always referred to by their transmit frequency, which can be found in an online or printed repeater directory.

Offset

Next, we need to make sure the proper transmit offset is programmed into the radio. This is the difference in frequency between the repeater transmit frequency and its receive frequency. Your transceiver will automatically shift your frequency when you transmit, if you have the right offset programmed. In most parts of the US, the standard offset is 600 kHz on the 2m band and 5 MHz on the 70cm band, and can be either in the positive (+) or negative (-) direction. Your repeater directory will list the offset and direction. Most radios will default to the standard offset but you may have to select + or - offset. Usually a + or - symbol will appear in the display to indicate the offset selected.

As an example, my repeater is on 447.725 MHz with a - 5 MHz offset. So you would enter 447.725 MHz into your radio, make sure the offset is set to 5 MHz and select - as the offset direction. You can verify that your radio is programmed correctly if you see 447.725 MHz displayed during receive, which should change to 442.725 MHz when you push the transmit button.

Tone

For most repeaters, you will need to transmit a CTCSS tone to access the repeater. (CTCSS is Continuous Tone Coded Squelch System.) Repeaters with carrier access do not require a tone, so you can skip this step. This is normally a two-step process: set the tone frequency and then enable the tone. Sometimes this is done with one selection (with “Off” being an option for the tone frequency). Some radios have separate settings for the transmit tone and receive tone. For now, just leave the receive tone off, since it can be a source of confusion. The tone that you need to set is your transmit tone. Most radios display a “T” somewhere on

the display when the tone is enabled. Again, check your operating manual.

Kerchunk

At this point, you should be ready to try accessing the repeater. After listening on frequency for a minute, transmit and identify using your callsign. On most repeaters, you will hear a short transmission coming back from the repeater along with a courtesy beep. A courtesy beep is just a short audio tone or tone sequence that occurs after someone finishes transmitting. If you hear the beep, then you accessed the repeater. Congratulations! Go ahead and make a call and see if someone will come back to you.

Troubleshooting

What if you don't hear the repeater coming back to you? Then we need to go into troubleshooting mode. If the radio is new, you might wonder if it is even working properly. The quality level of today's equipment is quite good, so most likely your radio is just fine. Still, you may want to check it out.

First, you can check to make sure your radio is receiving properly. In the US, a good way to do this is to tune into your local NOAA weather transmitter. These transmitters are on the air continuously, operating on 162.400, 162.425, 162.450, 162.475, 162.500, 162.525 or 162.550 MHz. These frequencies are outside of the 2m ham band but most ham transceivers are able to listen to these frequencies. You'll want to set this frequency as simply as possible... use the keypad or VFO mode to enter it directly. In most cases, you can just try the short list of frequencies until you hear the transmitter in your area.

Next, you might want to know that your radio is able to transmit a signal. The best way to do this is find a local ham nearby that can run a simplex check with you. By nearby, I mean within 5 miles or so, because we want someone so close that there is no question about whether they should be able to contact us. Program your radio to a 2m simplex frequency such as 146.52 MHz (the National 2m FM Simplex Frequency). For this test, we do NOT want the transmit offset turned on...the radio needs to be set to simplex. You can double check this by looking at the display when transmitting—it should show 146.52 MHz (transmit frequency is the same as the receive frequency). For this test, we don't care about the transmit tone... it can be on or off. Have the other ham give you a call and see if you can contact him. If you happen to have a second transceiver, you can try this test yourself -

just see if each radio can hear the other one. One warning: do this on a simplex frequency. Trying to go through a repeater can really confused things because you may not have the offset and tone set properly. Even more confusing is that one radio can "desense" the other radio, which means that the other radio's receiver will be overloaded and not able to receive the repeater's signal. Using simplex keeps things simple.

The final thing to check is whether your signal is able to reach the repeater. Well, that is a bit of a challenge! For starters, are you sure you are within range of the repeater? Have you ever heard a signal from this repeater, and was it full scale on your S meter? You may want to ask local hams about whether you should be able to hit the repeater from your location with the radio you are using. For that matter, you might want to check if the repeater is actually on the air - they do go down from time to time.

This brings us to an important point about the use of handheld transceivers. They are really, really handy. How else can you carry a complete ham radio station in your hand? Well, the tradeoff is that an HT operates with relatively low power (5 watts or less) and has a compromised antenna. (The standard rubber duck antenna on an HT is a very convenient crummy antenna.) You may need to add some extra umph to your signal by improving the antenna. Some good dualband choices are a longer whip such as the Diamond RH77CA, SRH77CA, or SRJ77CA or a magnetic-mount mobile antenna placed on a vehicle or on other metal object.

Summary

In this article, I've tried to provide some assistance in figuring out why you aren't hitting the repeater. The most common problem for newly acquired radios is getting them programmed (remember FOT: Frequency Offset and Tone). Once you have that right, it is usually just making sure that you have enough signal to make it to the repeater.

~ 73, Bob Witte K0NR

bob@k0nr.com / www.k0nr.com

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You might also check the Repeater tutorial on YouTube at: <https://www.youtube.com/watch?v=b-kR1MSgr9k>

December 2018

TECH TOPICS

Daniel Romila VE7LCG

Measuring 2018 LEDs Characteristics

After buying some Christmas lights from the Dollar Store I felt the need to measure some LEDs I bought from China and to share my findings about technical specifications, because old specs found on the Internet simply do not match.

My Christmas light, with 10 LEDs, have continuously functioned for the last 48 hours with power supplied by two rechargeable AA Energizer batteries. I have strong reason to believe they will continue to light after 80 days too. (By the way, my 10 LEDs Christmas light chain consume 565 microamps in total; those batteries should last forever - LOL)

But let's start some good old electrical measurements here, especially the voltage drop, the necessary current for workable visibility and the required

resistor in series for a 12 volt power supply. All my LEDs are from China and I suspect that wherever you've bought LEDs from, they are also manufactured in China. I have hundreds of each of the measured type, and they are consistent across the lots.

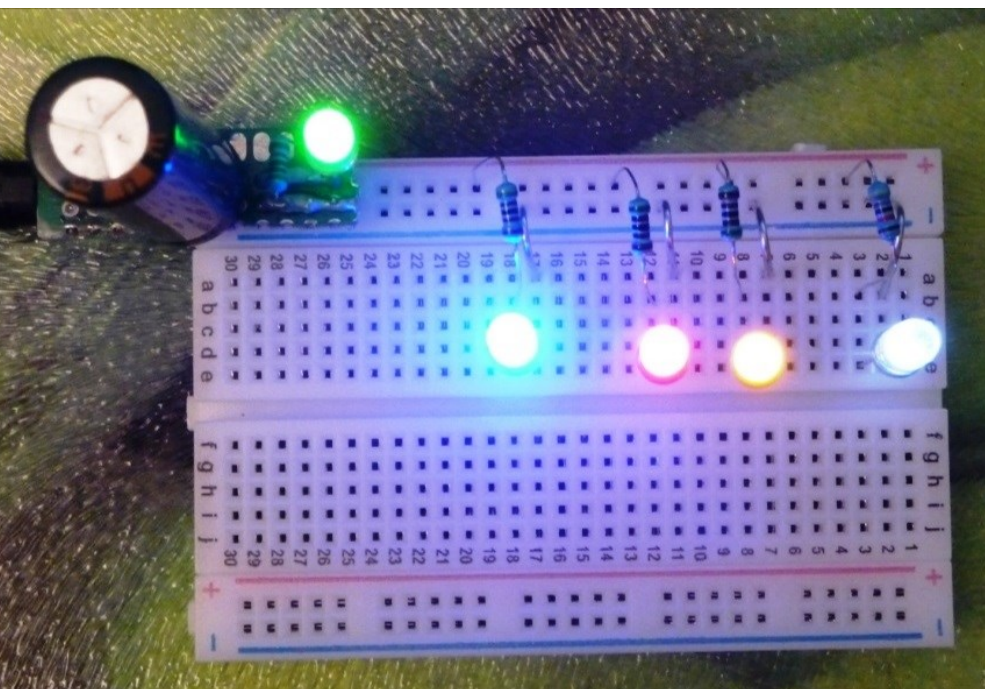
NOTE: My 3mm common anode LEDs are horrible. They are clear and the light consists of just 2 small points on the sides and completely unlit in the middle. They are good for use as a visual indication of having a voltage on the board, but no way I will ever put them on a panel. Since my whole lot might be defective I did not put them in the following table.

The voltage drop is variable across the LED depending on the current. In the table I put only the normal voltage drop. I like my LEDs to be visible, but not so bright to disturb me from seeing the important things on the panel, which are not usually the LEDs.

Please consider the above values just as an indication. They are real life measurements made with LEDs bought in 2018.

Practical considerations

The minimum resistor value I would put in series with my 5mm colored LEDs, when powered supplied from 12 Volts, would be 5.1K. The white 5mm LEDs are too bright with 5.1K (dangerously bright) and a 47K resistor would be the minimum. These values are for short period of time, or for



pulse work, like a light organ. In the picture you can see the brightness with the 5.1K resistor in series (47K for the white LED). Obviously, such brightness is too much for normal panel mounting and the values from the table look more suitable.

Type of LED	Voltage drop (normal functioning)	Current for normal visibility	Series resistor for 12 V normal visibility	Minimum usable current (still visible, not at the limit)	Series resistor for 12 V minimum lightning (still visible, not at the limit)
3 mm, WHITE	2.45 V	9.5 micro A	1 M	1.9 micro A	5 M
3 mm, RED	1.64 V	69 micro A	150 K	10.2 micro A	1 M
3 mm, GREEN	1.89 V	674 micro A	15 K	48 micro A	220 K
3 mm, YELLOW	1.84 V	199 micro A	51 K	3 micro A	1 M
3 mm, ORANGE	1.75 V	151 micro A	68 K	10.2 micro A	1 M
3 mm, BLUE	2.52 V	95 micro A	100 K	3.2 micro A	3 M
5 mm, WHITE	2.52 V	31.6 micro A	300 K	3.1 micro A	3 M
5 mm, RED	1.68 V	69 micro A	150 K	15.2 micro A	680 K
5 mm, GREEN	2.15 V	21 micro A	470 K	2.4 micro A	4 M
5 mm, YELLOW	1.81 V	150 micro A	68 K	34 micro A	330 K
5 mm, BLUE	2.49 V	95 micro A	100 K	14.1 micro A	680 K
3 mm common cathode, the RED part	1.69 V	69 micro A	150 K	10.5 micro A	1M
3 mm common cathode, the GREEN part	1.87 V	1.01 milli A	10 K	190 micro A	51 K

~ Daniel VE7LCG



Social Reminders

The Surrey weekly social gathering is on Saturday at the Kalmar Restaurant at 80th and King George Boulevard between 8 and 10:00 am. You don't have to be a SARC member to participate. Bring your significant other, bring your family, see old friends and have fun.

December 2018

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John Schouten VE7TI

On Becoming Active Again

We recently had a long-time Ham rejoin the hobby, having left to pursue other interests. John VA7XB sent him an email to welcome him back and, as a new SARC member, to invite him to become active in the many facets of the hobby our group provides. I have asked John for permission to publish an edited version of this email as it contains good advice for any of our members and those who have been 'away':

"Nice to have you rejoin the flock. You will find many changes in ham radio since you went "dormant" but there continues to be something new or traditional for every taste.

We try and attract seasoned members of the fraternity (like yourself) to our group because so many of our members are new to the hobby and need mentoring and technical instruction; there are so few who have the background and experience or who are willing to share their know-how.

As a club we have succeeded where many others have are failing, i.e. attracting "newbies" and that is due in large part to our ham classes and the Communicator. But it's a struggle, as we lose a few each year. Our membership hovers around 100-120 which is large by most standards these days.

No, there is no problem with not being a Surrey resident. Lately we have noticed that we are attracting members from all over the Lower Mainland as a result, we believe, of our high level of activity.

I am personally not into the FT8 and JT modes (yet) but it seems to be the hot trend. My time seems to be mostly spent in making improvements at the OTC including the setup of our new equipment and organizing contest activity. Which brings me to... Contests!

I might make a few suggestions for you:

1. Download and watch some Youtube videos on N1MM+ logger, which is the de facto standard contest logger: simple to use yet powerful.

For those active in CW or wishing to be:

2. Download "Morse Runner" from the Afreet website:
<http://www.dxatlas.com/morserunner>
and practice with simulated contests. I can't say enough about this program - it is so realistic and the ideal way to practice logging and getting ready for contesting. I use it to hone my rusty CW skills before every CW contest. You can set the CW speed, add QRM and QRN, pileups and even "lids" to the challenge.
3. Come out to the CQ WW DX CW contest, monitor activity and jump in if you feel inclined.

There isn't normally any contest pre-meeting, as our contest operators mostly know what is involved, but I would be pleased to introduce you to it during the actual contest or a few hours before-hand. You will quickly see what is involved.

Happy New Year!

- John VE7TI



It's December

There is no general meeting this month in lieu of our annual Christmas lunch. By the time you read this, the 'early bird' discount will have expired but you can still get a last minute ticket via PayPal.

The January program is not yet finalized but we should have more details in the next Communicator.

We leave you this month with our best wishes for a joyous holiday season and a happy and healthy New Year.

SARC hosts an Amateur Radio net each Tuesday evening at 8 PM. Please tune in to the VE7RSC repeater at 147.360 MHz (+600 KHz) Tone=110.9, also accessible on IRLP node 1736 and Echolink node 496228.

On UHF we operate a repeater on 443.775MHz (+5Mhz) Tone=110.9 or IRLP Node 1737.

	SARC Net 20:00 Hrs
1st Tuesday Standby	Drew VA7DRW Dixie VA7DIX
2nd Tuesday Standby	Jinty VA7JMR Sheldon VA7XNL
3rd Tuesday Standby	Rob VE7CZV Vacant
4th Tuesday Standby	Kapila VE7KGK John VA7XB
5th Tuesday Standby	Robert VA7FMR Vacant
Want a turn at Net Control? Contact the SARC Net Manager	

Down The Log...

SARC Monthly Meetings

2nd Wed. (Sept-Jun)
1900 hr at the PREOC
Emergency Mgmt BC
14292 Green Timbers
Way, Surrey, BC

Weekly SARC Breakfast

Saturday between 0800
and 1000 hrs at the
Kalmar Family Restaurant
8076 King George Blvd.
Surrey

SARC Net

Tuesday at 2000 hr local
on 147.360 MHz (+)
Tone=110.9

SEPARS Net

Tuesday at 1930 hr local
on 147.360 MHz (+)
Tone=110.9

VE7RSC Repeaters

2m: 147.360MHz+
Tone= 110.9Hz
IRLP node 1736
Echolink node 496228

1.2m: 223.960 Mhz -1.6
Tone=110.9

70cm: 443.775MHz+
Tone= 110.9Hz
IRLP node 1737



We Have A SARC Patch!

These are suitable for sewing on a jacket, cap or your jammies, so you can proudly display your support for SARC.

The price is \$4 each or three for \$10 and they can be picked up at a meeting or the weekly Koffee Klatch.

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